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OKLAHOMA GEOLOGICAL SURVEY
Chas. N. Gould, Director

Bulletin No. 14

CHEMICAL ANALYSES
of
OKLAHOMA MINERAL RAW MATERIALS

By
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UNIVERSITY OF OKLAHOMA
BULLETIN

CHEMICAL ANALYSES OF OKLAHOMA MINERAL RAW MATERIALS

BY
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DEPARTMENT OF CHEMISTRY
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OKLAHOMA GEOLOGICAL SURVEY
Dr. C. N. Gould, Director.

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ERRATA

On page 75, the first five rows of figures in the serial number column are correct, but the last five rows are to be disregarded. The correct last five rows of figures for the serial column are listed in the second row, the H_2O column, and are the last five rows of figures in this column. The H_2O column is incorrect, and the first five rows of figures should be disregarded as well as the remaining five which appear in the last five rows under serial numbers.

Important Notice: On page 4 in 4th paragraph in "key" the word "beginning" should read "end" since the table of contents was put at end of bulletin instead of at beginning as was originally intended.

Due to an error, the serial numbers on page 87 are incorrect. Add ten to each serial number to obtain the true serial number. For instance, Serial 256 is really 266. Thus, the serial numbers on page 87 start with No. 266 and continue through 285, instead of from 256 to 275. The reader on continuing from page 86 should turn first to page 88, then return to page 87.

On page 88, to obtain the true serial number, subtract 20 from each one. Thus, where the serial number, for instance, appears as 276, you should read 256. In other words, the serial numbers on page 88 start with No. 256 instead of 276, and continue through No. 265.

ALPHABETICAL AND SERIAL KEY NUMBERS TO THE ANALYSES

This bulletin is divided into two main parts:

Part I, contains Miscellaneous data on samples from Oklahoma localities. Primarily these samples are arranged, as far as possible, in alphabetical order under various sub-heads. Serial numbers are then assigned them in numerical succession from unity.

Part II, contains the tabulated analyses corresponding in number to the numerical citations in Part I; .i e., the numbers in both parts reciprocally refer to each other, and for any given number in Part I there will be found an identical number in Part II giving the analyses of the substance described under the same number in Part I.

Under each serial number of Part II preceding the analysis, is found a seperate, distinctive, numerical reference to a list of chemists (page 4), one of collectors (page 10), and a third of publications (page 14). Besides the corresponding numbers in these lists will be found the name and record of the chemist and collector, who analized or collected the substance in question, or in case of the publication, the source from which the analysis was taken.

In searching for the analysis of any particular material, the table of contents at the beginning of this bulletin is to be consulted and the material desired located. The serial limits there found will define the numerical range of that class of material so that a brief search within these bounds should readily disclose the particular analysis desired.

LIST OF CONTRIBUTING CHEMISTS

1. Allen, E. T., Chemical Geologist for the United States Geological Survey from March 1, 1901 to June 30, 1909. Citations; Nos. 274, 275,306, 365, 366, 1019, 1035, 1271, 1272.

2. Allen, Irving C., Oil Chemist for the United States Bureau of Mines. Citations: Nos. 1003, 1007, 1012, 1027, 1053, 1061-1063, 1075, 1076, 1084, 1089, 1100-1103, 1107, 1112, 1113, 1125, 1128, 1130-1132, 1137-1139, 1155-1157, 1171, 1178.

3. Aurin, F. L., M. A., University of Oklahoma, 1915. Formerly chemist for the Oklahoma Geological Survey. Now (1923) geologist for the Marland Petroleum Company, Ponca City, Okla. Citations: Nos. 11-18, 119, 479, 1106, 1210, 1211.

4. Bailey and Stafford. Citation: No. 53.

5. Bartlesville Zinc Company. Citations: Nos. 947-953.

6. Bayless, O. A., Chief chemist for the Oklahoma Portland Cement Co., Ada, Okla. Citation: No. 194.

7. Burke, George W., Iowa State College, Ames, Iowa. Citation: No. 245.

8. Burrell, Geo. Arthur, Ch. E., Ohio State University; DSc., Wesleyan University. Assistant chemist for the United States Geological Survey from Dec. 7, 1907 to July 1, 1910. Now (1923) consulting chemical engineer, United States Bureau of Mines, 2912 Equitable Building, New York, N. Y. Citation No. 891.

9. Buttram, Frank, M. A. University of Oklahoma, 1912. Fomer chemist and chief geologist for the Oklahoma Geological Survey. Now (1923) President of the Buttram Petroleum Corporation, 313-314 Mercantile Building, Oklahoma City, Okla. Citations: Nos. 104, 145-159, 161-168, 170, 172-193, 195-202, 436, 437, 440-442, 445-447, 454, 455, 457, 460-462, 473, 490-492, 502-504, 522-525, 534-536, 551, 555-560, 574-576, 578-582, 590, 611, 613-615, 622, 623, 636-639, 641, 658, 659, 661, 662, 665-667, 680, 682, 706, 707, 728, 730-733, 739, 741, 742, 747, 748, 753-760, 777, 783, 784, 808, 810, 812, 813, 815-818, 833-841, 857, 860-863, 1194-1197, 1370-1374.

10. Cady, Hamilton P., University of Kansas, with McFarland. (Cady and McFarland. Citations: Nos. 881, 956, 959.

11. Chamberlin, P. R., Chemist for the Dewey Portland Cement Co., Dewey, Okla. Citations: Nos. 65-71, 241-243.

12. Chambers, Alfred A., B. S. in Chemical Engineering, Ohio State University. Assistant chemist for the United States Geological Survey until July 31, 1919 when he resigned. Citations: Nos. 1182, 1294, 1387, 1388.

13. Choctaw Cement Company, Hartshorne, Okla. Citations: Nos. 121, 129.

14. Clifford, Chas. A., B. A. University of Oklahoma, 1907. Now City Chemist of Oklahoma City, Okla. 1158 13th St., Oklahoma City, Okla. Citations: Nos. 1273-1276, 1318-1327, 1419-1440.

15. Comar Oil Company. Citations: Nos. 1235, 1236, 1238, 1240.

16. Cross, Roy, Chemist with the Kansas City Testing Laboratory, Kansas City, Mo. Citations: Nos. 96, 238, 239, 363, 364.

17. Cullen, John A. Completed work for B. S. degree from Butler University. Assistant Chemist for Bureau of Mines until Apr. 30, 1922 when he resigned. Present address (1923) 1341 Franklin St. N. E. Washington, D. C. Citations: Nos. 1198-1290, 1202-1204, 1207 1208, 1212-1217, 1219, 1220, 1222, 1223, 1225.

18. Curtis, D., New York, N. Y. Citations: Nos. 1184, 1185.

19. Day, David Talbot, Ph. D. John Hopkins University. Consulting Engineer for the United States Bureau of Mines from 1917 to 1919. Now (1923) Consulting Chemist for the United States Bureau of Mines and Consulting Engineer in private practice. Address 2313 G St., N. W. The Mendota, Washington, D. C. Citations: Nos. 1004, 1005, 1008, 1009, 1013-1017, 1020-1022, 1028-1031, 1036-1052, 1068-1073, 1077-1083, 1085, 1086, 1105, 1108-1111, 1114-1123, 1140-1144, 1158, 1159, 1161, 1162, 1174-1177.

20. Day, Wm. C., Special Agent of the United States Geological Survey from July 1, 1899 to Mar. 10, 1905 when he resigned. Citation: No. 409.

21. Dean, Earnest W., Ph. D., Yale University. Consulting Chemist for United States Bureau of Mines and Chemist in charge of inspection department of Standard Oil Company of New Jersey. Address (1923), 26 Broadway, New York, N. Y. Citations: Nos. 1026, 1134-1136.

22. DeBarr, Edwin, Ph. D., Michigan University. Formerly head of Chemistry Department of the University of Oklahoma. Citations: Nos. 20, 229, 1127.

23. Department of Experimental Engineering of Cornell University. Citations: Nos. 97, 98, 236, 237.

24. Dow, Donald B., B. S., University of Nebraska. Now (1923) Associate Organic Chemist of the Bartlesville Station of the United States Bureau of Mines. Citations: Nos. 886-890, 892, 895-900, 946.

25. Drake, N. F. Citations: Nos. 681, 716, 859, 864.

26. E. E. Burlingame and Co., Denver, Colo. Citation: No. 729.

27. Empire Gas and Fuel Co. Citations: Nos. 917, 1243-1245, 1251, 1253.

28. Fairbanks-Morse Manufacturing Co. Citation: 456.

29. Fairchild, John G., A. B., Cornell University, Associate Chemist of the United States Geological Survey. Citations: Nos. 4, 6, 90-92, 117, 263, 1098.

30. Fieldner, Arno., Chemist for the United States Bureau of Mines. Citation: No. 459.

31. Fife, J. R., Assayer at Leadville, Colo. Citation: No. 360.

32. Fort Smith Analytical Co. Citation: No. 858.

33. Foster, Margaret D., A. B., Illinois College. Associate Chemist with the United States Geological Survey. Citation Nos. 1182, 1294, 1387, 1388.

34. Francis, C. K., Formerly with the Oklahoma Agricultural and Mechanical College. Citation: Nos. 1096, 1097.

35. Gardinier, R. F. Chemist for Bureau of Soils, United States Department of Agriculture. Citations: Nos. 1201, 1205, 1206, 1218, 1221, 1224, 1226.

36. Gridley, Eben C., Ph. C., University of Oklahoma, 1904. Address (1923) Orange, Mass. Many analyses cited in Pub. 36. Only general credit can be given.

37. Hailey-Ola Coal Co. Citations: Nos. 537, 538.

38. Harris, L. E., Student at the University of Oklahoma. Citation: No. 1187.

39. Haworth, Erasmus, Kansas Geological Survey. Citation: No. 120.

40. Henderson, Gulik. Citation: No. 903.

41. Hillebrand, Wm. Francis, Ph. D. Heidelberg, 1875. Chemist for United States Bureau of Standards (1923). Citations: Nos. 508, 561, 751, 768, 809.

42. Illinois Steel Company. Citations: Nos. 329-334.

43. Johnson, Homer L. Citation: 1404.

44. Kansas City Chemi-Technic Laboratory, Kansas City, Mo. Citations: Nos. 276, 352-354.

45. Kansas City Testing Laboratory, Kansas City, Mo. Citations: Nos. 134, 233, 355-358.

46. Katz, S. H. Chemist for the United States Bureau of Mines. Citations: Nos. 931-933.

47. Keiser, E. H., Washington University, St. Louis, Mo. Citations: Nos. 1192, 1193.

48. Kennicott Water Softening Company. Citations: Nos. 1179, 1189.

49. Kidwell, Cleo H., Graduate in Chemistry. Associate Chemist with the United Geological Survey until May 18, 1890 when he resigned. Now (1923) with the Solvay Process Co., Syracuse, N. Y. Citations: Nos. 1182, 1294, 1387, 1388.

50. Kirshbrain, L., Chicago, Ill. Citation: No. 1098.

51. Law, S. M., B. S., University of Kansas. Junior Chemist at Bartlesville Station of the United States Bureau of Mines, Bartlesville, Oklahoma. Citations: Nos. 1054-1060.

52. Ledonx Chemical Laboratory, New York, N. Y. Citation: No. 867.

53. Lerch, W. B. Chemist at Bartlesville Station of the United States Bureau of Mines, Bartlesville, Okla. Citations: Nos. 1064-1067, 1163-1165.

54. Mahaffie, O. B. M. S., University of Oklahoma, 1922. Citations: Nos. 417-427, 430-432.

55. McCreath, A. S. Citations: Nos. 746, 814, 842, 847, 848.

56. McFarland, David F. with Cady (Cady & McFarland). Citations: Nos. 881, 956, 959.

57. Moechel, J. Robert, Kansas City, Mo. Citations: Nos. 108, 109, 234, 235, 264, 1188.

58. Neal, Ray D., B. S. in Chemical Engineering University of Kansas. Formerly Petroleum Chemist for the United States Bureau of Mines. Now (1923) Gasoline Manufacturer at 1022 Kennedy Building, Tulsa, Oklahoma and Consulting Engineer for United States Bureau of Mines. Citations: Nos. 886, 890, 892.

59. Nicholas, Henry Windsor, Assistant Curator of the Field Columbian Museum of Natural History, Roosevelt and Lake Michigan, Chicago, Ill. Citation: No. 264.

60. Office of Public Roads Washington, D. C. Citation Nos. 369, 386, 387, 400.

61. Oklahoma Agricultural and Mechanical College, Stillwater, Okla. Citation: No. 1190.

62. Oklahoma Geological Survey Laboratory. Citations: Nos. 77, 281-290, 304.

63. Oklahoma Portland Cement Company, Ada, Oklahoma. Citations: Nos. 248-252.

64. Palmer, Chas, Ph. D. John Hopkins University, 1882. Assistant Chemist for the United States Geological Survey from 1907 to October 31, 1919, address (1923) 2919 Pacific Ave., San Francisco, California. Citation: No. 51.

65. Petraeus, W. W., Joplin, Mo. Citation: No. 305.

66. Porter, Earl Sellers, M. A. University of Oklahoma, 1912. Citations: Nos. 314-328, 370, 382, 405-407, 439, 571, 693, 743-745, 750, 831, 843.

67. Rattle and Nye, Cleveland, Ohio. Citations: Nos. 335-340.

68. Richardson, Clifford, Chemist in United States Department of Agriculture. Citations: Nos. 371-381, 383-385, 388-399, 403, 404.

69. Rock Island Coal Mining Company. Citation No. 559.

70. R. W. Hunt Engineering Company, Chicago, Ill. Citations: Nos. 95, 240.

71. Seibel, C. W. Chemist for United States Bureau of Mines. Citations: Nos. 955, 957, 958, 960-965, 969, 970, 983-988, 997-1002.

72. Shead, Arthur Curtis, M. S. University of Oklahoma, 1923, Chemist for Oklahoma Geological Survey 1918-1923. Graduate Assistant in Chemistry University of Illinois, 1923-24, Assistant Prof. of Chemistry, Uni. of Oklahoma, 1924. Citations: Nos. 1-3, 8-10, 22-26, 39, 45, 49, 50, 52, 54, 64, 72, 78-88, 93, 94, 99-103. 105 106, 110, 111, 113-115, 127, 136-183, 140, 141, 144, 171, 203-228, 230-232, 246, 253, 257, 258, 261, 262, 265, 267-273, 359, 361, 362, 368, 401, 402, 428, 429, 433-435, 806, 849, 1006, 1074, 1129, 1145-1154, 1172, 1173, 1180, 1181, 1186, 1464.

73. Sherwin, Ralph S., B. S. University of Oklahoma, 1903, now (1923) Chief Chemist for the Aluminum Ore Company, 4248 Lafayette Ave., St. Louis, Mo. Citations: Nos. 21, 27-38, 41-44, 46-48, 254-256.

74. Shinkle, Vincent Carman, Formerly City Chemist for Oklahoma City, Oklahoma. Citation: No. 1263.

75. Solvay Process Company, Hutchinson, Kansas. Citation: No. 1209.

76. State Chemist of Pennsylvania. Citation: No. 478.

77. Steiger, George, M. S. Columbia University. Now (1923) Chief Chemist of the United States Geological Survey. Citations: Nos. 5, 511, 562, 563, 607-609, 640, 663, 751, 768, 809, 865, 866, 1024, 1025.

78, St. Louis Sampling and Testing Works. Citations: Nos. 458, 1018, 1023, 1160.

79. United States Bureau of Mines. Citations: Nos. 438, 443, 444, 448, 449, 451-453, 471, 472, 475, 477, 481-486, 493-501, 505, 506, 507, 514-521, 526-533, 539-541, 552-554, 566-570, 591-606, 616-621,, 624-633, 642-657, 669-679, 694-705, 718-724, 761-767, 786-797, 819-824, 850-852, 854-856, 868-874, 875-880, 882-885, 893-894, 901, 902, 904-906, 909-916, 919-930, 938-940, 942-945, 954, 1099, 1133, 1166-1169, 1230, 1234, 1237, 1239, 1241, 1242, 1246-1250, 1252, 1254, 1255, 1328.

80. United States Geological Survey. Citations: Nos. 1182, 1294, 1298-1300, 1304, 1305, 1387, 1388.

81. University of Oklahoma. Citations: Nos. 122, 130-133.

82. University of Texas. Citations: Nos. 799-803.

83. Vanier, George O., Chemist for Penn., Steel Company. Citations: Nos. 727, 778.

84. Waring, W. G., Chemist at Webb City, Mo. Citations: Nos. 296, 303, 1183, 1227-1229, 1392.

85. Watertown Arsenal, Watertown, Mass. Citation: Nos. 259.

86. Wells, Roger C. PhD. Harvard University, Chemist for the United States Geological Survey. Citation: Nos. 1229.

87. Whittaker, M. C., Chemist for United States Bureau of Mines. Citations: Nos. 1090, 1091.

88. Williams, Guy Yandell, PhD. University of Illinois, Professor of Physical Chemistry and Head of Department of Chemistry, University of Oklahoma. Citations: Nos. 1010, 1011, 1032-1034, 1087, 1088, 1092-1095, 1124, 1126, 1170.

89. Wixford, John F. St. Louis, Missouri. Citation: No. 1191.

LIST AND QUALIFICATIONS OF CONTRIBUTING COLLECTORS

1. Allen, Irving C. Oil Chemist for the United States Bureau of Mines. Citations: Nos. 1090, 1091.

2. Aurin, F. L. See No. 3 in list of Chemists. Citations: Nos. 105, 106, 110, 111.

3. Bain, H. Foster. Connected with the United States Geological Survey. Citations: No. 274, 275, 306, 365, 366.

4. Blair, A. C. Farmer, R. R. 4, Hasting, Oklahoma. Citation: No. 368.

5. Bradley, O. A. Connected with the United States Bureau of Mines. Citations: Nos. 1062, 1063.

6. Burgess, W. T. Inspector of the United States Bureau of Mines. Citations: Nos. 487-489, 552-554, 691, 692, 737, 738.

7. Burrows, J. Shober. Inspector of the United States Geological Survey. Citations: Nos. 465, 466.

8. Burton, Geo. D. A. B. Indiana University, Formerly Assistant Director of the Oklahoma Geological Survey. Citations: Nos. 314-328.

9. Buttram, Frank. See No. 9 in list of Chemists. Citations: Nos. 11-14, 16-18, 145-159, 161-168, ,107 172-193, 195-202.

10. Bybee, H. P., Prof. of Geology, Uni. of Texas, Austin, Texas. Citations: Nos. 257, 258, 1181.

11. Cady, Hamilton P. See No. 10 in list of Chemists. Citations: Nos. 956, 959.

12. Carson, C. W., Norman, Oklahoma. Citation: No. 1129.

13. Clark, H. C., Valliant or Glover, Oklahoma. Citations: Nos. 401, 402.

14. Clifton, P. L. Pomeroy, Ohio. Citations: Nos. 1225, 1226.

15. Davies, J. F., Inspector of the United States Bureau of Mines. Citations: Nos. 519-521, 605, 606, 627, 645, 647, 669-679, 721-724, 764-768, 873, 874.

16. Decker, Dr. C. E. Professor of Geology in the University of Oklahoma. Citation: No. 849.

17. Delaplain. See Carson, No. 12 above. Citation: No. 1129.

18. Dill, G. W., 810 Insurance Bldg., Oklahoma City, Oklahoma. Citation: No. 1074.

19. Dobbins, C. E., Collector for the United States Geological Survey. Citations: Nos. 957, 958, 960-965, 1001, 1002.

20. Dunlap, J. P. Collector for the United States Bureau of Mines. Citations: Nos. 1004, 1005, 1008, 1009, 1013-1017, 1020-1022, 1028-1031, 1036-1046, 1068-1073, 1077-1083, 1085, 1086, 1108-1111, 1114, 1123, 1140-1144, 1158-1162, 1174-1179.

21. Eby, E. G. and Ensminger, J. A., Wagoner, Oklahoma. Citations: Nos. 270-273.

22. Edson, Frank A. A. B. University of Michigan 1903, Formerly Field Geologist for Oklahoma Geological Survey. Citations: Nos. 22-26, 39, 40, 45, 49, 50, 52, 267.

23. Fleming, J. R. Inspector of the United States Bureau of Mines. Citations: Nos. 498-501, 526-533, 616-621, 648-653.

24. Fleming, W. W., Inspector of the United States Bureau of Mines. Citations: Nos. 654, 669-673.

25. Frye, Chas. O., Room 203 at 206½ Main Street, Tulsa, Oklahoma. Citation: No. 94.

26. Gammie, James, and Son., 307 South First Street, Ponca City, Oklahoma. Citation: No. 140.

27. German, W. J., Inspector of the United States Bureau of Mines. Citations: Nos. 552-554.

28. Gould, Chas. Newton, PhD. Nebraska University. Director of Oklahoma Geological Survey August 1908 to October 1911, and 1924————. Citation: No. 264.

29. Groves, John W., Inspector of the United States Geological Survey. Citations: Nos. 509, 510, 542-544, 771, 772, 779, 780, 825-830, 1054-1060.

30. Harpending, Jno. L., Smithville, Oklahoma. Citation: No. 1464.

31. Harrington, Daniel, Inspector of the United States Bureau of Mines. Citations: Nos. 495-497.

32. Heggem, A. G., Inspector of the United States Bureau of Mines. Citation: No. 448.

33. Hill, B. H., Loveland, Oklahoma. Citation: No. 2.

34. Honess, Chas. Wm., Ph. D. Columbia University. Chief Geologist for Oklahoma Geological Survey. Citations: Nos. 3, 10, 206-228.

35. Hyde, C. B. Konawa, Oklahoma. Citation: No. 269.

36. Hynal, J. B., Inspector of the United States Bureau of Mines. Citations: Nos. 526-533, 539-541, 628-633, 655-657, 694-705, 786-797, 819-824.

37. Iddings, J. P., Connected with United States Geological Survey. Citation: No. 5.

38. Johnson, S. L., Okmulgee, Oklahoma. Citation: No. 359.

39. Jones, L. M., Geologist for United States Geological Survey. Citations: Nos. 463, 464, 513, 572, 785, 832.

40. Koster, J. W., Inspector of the United States Bureau of Mines. Citations: Nos. 648-653.

41. Larimore, W. L., Secretary of Chamber of Commerce, Hugo, Oklahoma. Citations: Nos. 78, 79.

42. Leedy, C. B., Arnett, Oklahoma. Citation: No. 229.

43. Lewis, R. J.., R. R. 2, Box 4, Ada, Oklahoma. Citation: No. 268.

44. McCoubrey, W. H., Inspector of the United States Bureau of Mines. Citations: Nos. 514-518, 526-533, 539-541, 566-569, 591-604, 624-626, 628-633, 642-644, 655-657, 694-705, 718-720, 761-763, 786-797, 819-824, 868-872.

45. McFarland, David F., Collector with Cady, No. 11 in this list. Citations: Nos. 956, 959.

46. McRuer, Rev. Duncan, Norman, Oklahoma. Citations: Nos. 428, 429.

47. Meyer, Arthur, B. S. University of Oklahoma, 1921. Field Assistant for Oklahoma Geological Survey. Citations: Nos. 1101, 1150-1154.

48. Montgomery, W. W., Bromide, Oklahoma. Citation: No. 119.

49. Moore, W. L. Nowata, Oklahoma. Citation: No. 479.

50. Morgan, G. W., Field Geologist for the Oklahoma Geological Survey. Citation: No. 277.

51. Newberry, W. White, Pawhuska, Oklahoma. Citation: No. 361.

52. Nicholls, W. T., 501 East 9th Street, Ada, Oklahoma. Citations: Nos. 171, 194.

53. Oakes Malcolm C. M. S. University of Oklahoma, 1922. Field Geologist for Oklahoma Geological Survey. Citations: Nos. 54, 64, 80-88, 93, 113-115, 127, 141, 261, 422-427, 1145-1149.

54. Oklahoma Geological Survey. Citations: Nos 281-290, 431, 432.

55. Patten, LeRoy, Professor of Geology, Muskingum College, New Concord, Ohio. Field Geologist for Oklahoma Geological Survey. Citations: Nos. 99, 203, 230-232.

56. Reed, W. J. Citation: No. 1105.

57. Rider, Chas. R. Formerly Field Assistant for the Oklahoma Geological Survey. Citation: No. 1006.

58. Rogers, G. Sherbourne, Connected with the United States Geological Survey. Citations: Nos. 955, 969, 970, 983-988, 997-1000.

59. Rothrock, E. P. Formerly Professor of Geology in the University of Oklahoma and Field Geologist for the Oklahoma Geological Survey. Citations: Nos. 1, 144, 430, 433-435.

60. Rutledge, J. J. Inspector for the United States Bureau of Mines. Citations: Nos. 495-497, 526-533, 654, 669-673, 850, 852, 855.

61. Shaler, M. K. Connected with the United States Bureau of Mines. Citations: Nos. 565, 573, 577, 583, 749, 807.

62. Shannon, Chas. Wm. A. M. Indiana University, 1907. Director Oklahoma Geological Survey August 1923. Now (1924) Director of Bureau of Geology, Norman, Oklahoma. Citations: Nos. 436, 437, 440-442, 445-447, 454, 455, 457, 460-462, 473, 490-

492, 502-504, 522-525, 534-536, 551, 555-560, 574-576, 578-582, 590, 611, 613-615, 622, 623, 636-639, 641, 658, 659, 661, 662, 664, 665-667, 680, 682, 706,707, 728, 730-733, 739, 741, 742, 747, 748, 753-760, 777, 783, 784, 808, 810, 812, 813, 815-818, 833-841, 857, 860-863.

63. Shead, Arthur C. See No. 72 in list of Chemists. Citations: Nos. 8, 9, 72, 102, 103, 136-138, 204, 205, 262, 263, 1172, 1186, 1187.

64. Simpson, E. J., Norman, Oklahoma. Citation: No. 253.

65. Smith, C. D. Geologist for United States Geological Survey. Citations: Nos. 443-444, 449, 475, 477, 481, 482, 485, 486, 512, 725, 734, 740, 844-846.

66. Smith, Evan. Formerly Field Assistant for the Oklahoma Geological Survey. Citations: Nos. 22-26, 39, 40, 45, 49, 50, 52, 267.

67. Smith, H. I., Inspector for United States Bureau of Mines. Citations: Nos. 683-690, 709-715, 750.

68. Snyder, N. H., Inspector for United States Bureau of Mines. Citations: Nos. 519-521, 605, 606, 627, 645-647, 674-679, 721-724, 873, 874.

69. Stephenson, C. S. Inspector of United States Bureau of Mines. Citations: Nos. 691, 692, 737, 738.

70. Stratton, R. V. L., Geologist of the United States Geological Survey. Citations: Nos. 483, 505, 506.

71. Taff, Joseph A., Geologist for the United States Geological Survey. Citations: Nos. 508, 561, 751, 768, 809.

72. Thoma, W. M., Quapaw, Oklahoma. Citations: Nos. 100, 101.

73. Thompson, A. W., Geologist of the United States Geological Survey. Citations: Nos. 634, 717, 735, 736.

74. Thompson, Wallace, Formerly Field Geologist for the Oklahoma Geological Survey. Citations: Nos. 257, 258, 265.

75. Trout, Lawrence E., Formerly Field Geologist for the Oklahoma Geological Survey. Citation: No. 246.

76. Von Borries, W. T., Inspector of the United States Geological Survey. Citations: Nos. 509, 510.

77. Ward, C. F., Connected with United States Bureau of Mines. Citations: Nos. 966-968, 971-982, 989-996.

78. Wegemann, Carroll H., Geologist for the United States Geological Survey. Citations: Nos. 891, 904.

79. White, D., Geologist for United States Geological Survey. Citations: Nos. 484, 451, 854, 856.

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PART I. LOCATION AND DESCRIPTION OF SAMPLES.

IGNEOUS ROCKS (1-18)

1. BASALT. Black Mesa diabase. 2 mi. N. of Kenton, Cimarron Co., sec. 33, T. 6 N., R. 1 E. Sample of fragments from an 800 lb. boulder at Oklahoma State Fair. Res. consists of S. 0.08 pct. and Cr_2O_3, 0.04 pct. Rock from easterly portion of Tertiary Mesa de Maya lava flow.

2. BASALT (?) or "Drillite". Granfield, Tillman Co., SW. ¼ sec. 35, T. 3 S. R. 16 W. Fragment of rotary core from a depth of 2,985 ft. in Daymon well. Res. consists of S. Rock resembles a basalt, megascopically.

3. DIORITE. Dike N. of Glover, McCurtain Co. SE. ¼ sec. 10, T. 5 S., R. 23 E. Res. consists of CO_2.

GRANITES. (4-7)

4. Cold Springs, Wichita Mts. **5.** Lugert. W. of Mt. Sheridan, Wichita Mts. Res. consists of Ba0, 0.04 pct. and Sr0, 0,02 pct. **6.** Reformatory. Wichita Mts. **7.** Spavinaw dike. Mayes Co. sec. 10, T. 22 N., R. 21 E. 6 mi. N. of Spavinaw Creek on its N. bank.

VOLCANIC ASH. (8-18).

8. Pemberton Prospect. 5 mi. N. of Gate, Beaver Co., N. ½ NW. ¼ sec. 8 ,T 5 N. R. 28 E. Sample represents 2,400 sq. ft. of face. Colorless.

9. Haynes farm, 8 mi. NE. of Gate, SW. ¼ sec. 10, T. 28 N., R. 26 W., Harper Co. Abundant. Colorless. 97.0 pct. passes a 200 mesh sieve.

10. TUFF. 300 paces S. of center of sec. 8, T. 5 S., R. 26 E., McCurtain Co., in bed of Lick Creek. It is near the base of the Standley shale. Thickness, 100 ft.

11. Near Alva, Woods Co. **12.** Near Custer City, Custer Co. SE. ¼ sec. 15, T. 14N., R. 16 W. **13.** Near Darrow, Blaine Co. **14.** Near Gate in Beaver and Harper Counties. **15.** Near Muskogee, Muskogee Co. **16.** 7 mi. S. of Okemah, Okfuskee Co. **17.** W. of Tangier, Woodward Co. **18.** Near Thomas, Custer Co.

SEDIMENTARY ROCKS. (19-258)

EARTHS. (19-20)

19. Fullers Earth, "Glaciolite". Near Enid, Garfield Co. **20.** Diatomaceous Earth, from E. central part of NW. ¼ sec. 1, T. 5 N., R. 27 E., Beaver Co. The deposit is 12 ft. thick. The diatoms contribute the silica.

SEDIMENTARY ROCKS. (19-258).

GYPSUM AND GYPSITE. (21-53)

21-22. Ferguson member of Blaine formation. 21. 4 mi. W. of Ferguson, Blaine Co. **22.** NE. ¼ sec. 26, T. 19 N., R. 12 W. Near Idebel, NW. Blaice Co.

23-35. Medicine Lodge member of Blaine formation. 23-25. Prim quarry, at Ideal, NW. Blaine Co. sec. 26, T. 19 N., R. 12 W. **26.** Rubey quarry, 4 mi. W. of Ferguson, Blaine Co. **27-35. Salt and Bitter Creek section. 27-29.** "Salt Creek Marble" near head of Salt and Bitter Creek, Blaine Co. Middle part of the middle ledge of the member. Thickness, 8-10 ft. Area of outcrop, 10 mi. long by 1 mi. wide. **29.** "Red-Marble." **30.** Lower part of middle ledge. **31-32.** Middle part of middle bed. **33-35.** Top part of the member.

36-39. Shimer member of the Blaine formation. 36-38. 4 mi. W. of Ferguson, Blaine Co. **36.** Lower part of bed. **37.** Middle of bed.

38. Top part of bed. **39.** Southard quarry, Marion (?) deposit, NW. ¼ sec. 10, T. 18 N., R. 12 W., property of the United States Gypsum Co.

40-53. Unidentified Gypsums. **40-41.** Near Cement, Caddo Co. **40.** SE. ¼ sec. 7, T. 6 N., R. 9 W. **41.** 5 mi. SW. of Cement. **42.** From cave, 5 mi. NW. of Weatherford, Custer Co. **43.** Bed 4 mi. W. of Weatherford. **44.** 5 mi. W. of Weatherford, near a sandstone. **45.** Sec. 23, T. 4 N., R. 8 W. near Acme, Grady Co. **46.** Satin spar from a canyon, 4 mi. W. of Ferguson, Blaine Co. **47.** Selenite flakes from Mt. Heman, E. Woodward Co. **48.** Concretions from Henquenets canyon, 4 mi. W. of Ferguson, Blaine Co. **49.** Lower part of bed in Okarche quarry, sec. 34, T. 14 N., R. 8. W., near Okarche, Canadian Co. **50.** Weatered Gypsum, Quinlan quarry, sec. 10, T. 23 N., R. 17 W., Woodward Co. **51.** Watonga, Blaine Co.

52. Bottom of gypsite, Eldorado, Jackson Co., SE. ¼ sec. 7. T. 1 S., R. 23 W.

53. Near Marlow, Stephens Co.

LIMESTONES. (54-144)

54-58. Arbuckle Limestone. 54. Middle member. NW. ¼ SW. ¼ sec. 25, T. 2 S., R. 3 E. Dolese Bros. Co., Quarry No. 7, Arbuckle Switch (Crusher) Murray Co. Face of quarry is 105 ft. high by 800 ft. long. The sample was representative. Sampled 8/x/'21. Analyzed 11/29/'21. **55.** S. of Davis, Murray Co. **56.** sec. 32. T. 4 N., R. 11 W., Richards Spur, Comanche Co. Face of quarry, 50 ft. high by 500 ft. long. **57.** Middle of bed. **58.** Lower part of dolomite zone.

59-61. Boone Limestone. 59. Near Grove, Delaware Co

SEDIMENTARY ROCKS. (19-258)

LIMESTONES. (54-144)

60. Grove. Quarry of Grove White Lime Co. **61.** Near Ft. Gibson, Muskogee Co.

62. Chimneyhill Limestone.

63-64. Day Creek Dolomite. 63. Summit of Red Hills, 6 mi. NW. of Geary, Blaine Co. Bed is 3 ft. thick. **64.** NW. ¼ sec. 25, T. 15 N., R 12 W., Blaine Co. Bed is 18 in.-2 ft. thick.

65-71. Dewey Limestone. Dewey Portland Cement Co., quarry, Dewey, Washington Co., T. 27 N., R. 13 E. **65.** Top buff bed. **66.** Lower blue bed. **67-71.** Top and lower beds together, 20 ft. thick.

72. Fayetteville Limestone. Limestone parting in Fayetteville shale. Near Locust Grove, Mayes Co., half-way-up a hill on O. W. Killman farm, sec. 30, T. 20 N., R. 20 E.

73-87. Goodland Limestone. 73. 12 mi. N. of Durant, Bryan Co. **74-76.** Ft. Towson White Lime Co quarry, Ft. Towson, McCurtain Co. **77.** Old Caddo Lime Co. quarry, Caddo Atoka Co. **78.** Near Hugo, Choctaw Co., S. ½ SW. ¼ sec. 2, and N. ½ NW. ¼ sec. 11, T. 6 S., R. 17 E. **79.** Ft. Towson White Lime Co. quarry, on an 160 acre lease in S. ½ NW. ¼ sec. 19, T. 6 S., R. 19 E., near Ft. Towson, Choctaw Co. **80-87.** From near Marietta, Love Co. **80, 82, 84, 86.** SE. ¼ sec. 5, T. 7 S., R. 2 E., 2½ mi. N. of Marietta, on Jerry branch, E. of Gulf, Colorado, and Santa Fe R. R. (except No. 86 which is W. of R. R.). **80.** Top bed, 7 ft., 8 in. thick. **82.** Bed next to top bed, 6 ft., 5 in. thick. **84.** Bed next to lowest bed, 5 ft., 10. in. thick. **86.** Bottom bed, 3½ ft. thick. W. of R. R. **81, 83, 85, 87.** SE. ¼ SW ¼ sec. 16, T. 7 S., R. 1 E., 5 mi. due W. of Marietta, where road crosses Rock Creek. **81.** Top bed, 8 ft., 10 in. thick. **83.** Bed next to top bed, 7 ft., 2 in. thick. **85.** Bed next to bottom bed, 5 ft., 1 in. thick. **87.** Bottom bed, 2 ft., 6 in. thick.

88. Herington Limestone. SW. ¼ sec. 23, T. 26 N., R. 2 E. 1¼ mi. N. and ½ mi. E. of Ponca City, Kay Co., Owen quarry. Bed is 9 ft. 3 in. thick.

89-92. Hunton Limestone. 89. Near Dougherty, Murray Co. **90-92.** Moseley Creek Manganesee Dposit, No. 1, SW. ¼ sec. 28, T. 1S., R. 8 E., Coal Co. **90.** Unaltered stone from surface, 15 ft. S. of fracture. **91.** Altered stone from surface, 2 ft. S. of fracture. **92.** Altered stone from fracture zone.

93. Lenapah Limestone. NW. ¼ sec. 19, T. 28 N., R. 16 E., 3 mi. N. of Lenapah, Nowata Co.

94-98. Lost City Limestone. **94.** SE. corner sec. 15, T. 19

SEDIMENTARY ROCKS. (19-258)

LIMESTONES. (54-144).

N., R. 11 E., 1 mi. SW. of Sand Springs, Tulsa Co. Bed is 48 ft. thick. Polished stone shows decorative markings. **97.** 35 ft. thick.

99. Mangum Dolomite.

100-102. Mayes Formation Limestone. 100-101. SW. ¼ sec. 27, T. 28 N., R. 23 E., near Quapaw, Ottawa Co. Stone is blue, fossiliferous and semi-crystalline. Bed is 10 ft. thick and has 10-20 ft. over-burden. **102.** Sec. 30, T. 20 N., R. 20 E., farm of O. W. Killam, near Locust Grove, Mayes Co. Top beds of platy, fossiliferous stone.

103-106. Morrow Formation Limestones. 103-104. Sec. 30, T. 20 N., R. 20 E., top of hill on O. W. Killam farm, near Locust Grove, Mayes Co. Bed is about 15 ft. thick. Stone is brownish and fossiliferous. **105-106.** Rock Bluff on Arkansas River, 4 mi. SW. of Ft. Gibson, Muskogee Co., Schaffer prospect. Upper beds.

107. Oolagah Limestone. Garnett, E. of Tulsa, Tulsa Co.

108-109. Pawnee Limestone. Sec. 27, T. 26 N., R. 16 E., 3 mi. E. of Nowata, Nowata Co., Valley of Verdigris River, Prospect of Old British-American Portland Cement Co.

110.-112. Pitkin Limestone. 110-111. Rock Bluff, Arkansas River, 4 mi. SW. of Ft. Gibson, Muskogee Co., Schaffer prospect., Lot 1, sec. 32, T. 15, N., R. 20 E., base of limestone. **112.** Near Marble City, Sequoyah Co.

113. Short Creek Oolithic Limestone. SE. ¼ sec. 19, T. 24 N., R. 24 E., an old quarry on Spring River, near Wyandotte, Ottawa Co. Bed is 6 ft. thick. Stone is very white and very soft.

114-115. Sycamore Limestone. NW. ¼ sec. 6, T. 3 S., R. 3 E., 1½ mi. SW. of Crusher, in Carter Co., and just S. of R. R. bridge over Washita River. **114.** 65 ft. bed, above shale parting. **115.** 56 ft. bed below shale parting.

116. Taloga Dolomite.

117-124. Viola Limestone. 117-120. Near Bromide, Johnson Co. **117.** SE. ¼ sec. 14, T. 2 S., R. 7 E. out of N. wall of Springbrook Manganese Deposit. Analysis of clear, white, stone. **120.** Quarry of Bromide Oolitic Stone Works. **121.** Ada (Oolite Station), Pontotoc Co. **122.** Quarry of Oklahoma Oolite Stone Co., Fitzhugh, Pontotoc Co. **123.** Lawrence, Pontotoc Co.

125-139. Wapanucka Limestone. 125-127. Bromide, Johnson Co. **126.** Oolitic. **127.** SW. ¼ sec. 4, T. 2 S., R. 8 E. Quarry face is 60 ft. high, 150 ft. long from N. to S., and 100 ft.

SEDIMENTARY ROCKS. (19-258)

LIMESTONES. (54-144)

wide from E. to W. Stone is white, massive, oolitic, and soft. **128-138. Choctaw Portland Cement Co.** Quarry, near Hartshorne, Pittsburg Co. **128.** Non-oolitic. **136-138.** NW. ¼ sec. 18, T. 4 N., R. 17 E., where Blue Creek cuts the N. limestone ridge. **136.** Sample from drier of cement plant, and represents stone from all parts of quarry. **137.** 15 ft. ledge lying immediately above main 40 ft. bed. **138.** Main 40 ft. Bed.

139. Reynolds, Atoka Co., about 3 mi. SW. of Kiowa and 15 mi. SW. of McAlester at crossing of M. K. & T. and C. R. I. & P. R. Rs. in sec. 3, T. 2 N., R. 13 E. Holdings of Oklahoma Oolitic Stone Co.

140-141. Winfield Limestone. 140. Sec. 12, T. 26 N., R. 2 E., 3½ mi. NE. of Ponca City, Kay Co., on lease of Jas. Gammie & Son. Massive bed, 5 ft. thick. **141.** SE. ¼ sec. 23, T. 26 N., R. 2 E., Jno. Evans quarry, ½ mi. N. of Ponca City, Kay Co. Bed is 5 ft. 8 in. thick.

142. Unnamed Limestone. Top of Keechi Hills, Caddo Co.

143. Unnamed Limestone. Bermuda Lawn Stock Farm, 7 mi. W. and 2 mi. N. of Lookeba, Caddo Co.

144. Unnamed Limestone. Nussbaum Formation, N¼ corner, sec. 31, T. 6 N., R. 8 E., Cimarron Co. Cap rock 1½ ft. thick.

SANDS AND SANDSTONES. (145-232)

145. Burgen Sandstone. SW. corner sec. 31, T. 18 N., R. 23 E., 5 mi. SW. of Tahlequah, Cherokee Co. Sampled from a 50 ft. bluff on Illinois River.

146. Silo Sandstone. 1½ mi. NE. of Normal School Bldg in Durant Bryan Co. Out of an 8 ft. bed in a creek bank.

147-193. Simpson Sands. 147-159. Cool Creek Section. Sec. 35, T. 2 S. R. 2 E. **147.** 5 ft from top. **148.** 12 ft. from top. **149.** 18 ft. from top. **150.** 27 ft. from top. **151.** 39 ft. from top. **152.** 65 ft. from top. **153.** 10 ft. from top. of bed mentioned in 152. **154.** 30 ft. below top of bed mentioned in 152. **155.** 40 ft. below top of bed mentioned in 152. **156.** 50 ft. below top of bed mentioned in 152.

157. 20 ft. below top of bed mentioned in 149. **158.** 43 ft‡ below top of bed mentioned in 149. **159.** Near bottom of bed mentioned in 149. **160-166. Crusher Section.** ½ mi. S. of Crusher, Murray Co., cut of Gulf, Colorado & Santa Fe R. R. and on banks of Washita River. **167-169. Hickory, Murray Co. 167.** 250

SEDIMENTARY ROCKS. (19-258)

SANDS AND SANDSTONES. (145-232)

yds. SW. of ½ mi. stone on N. line of sec. 15, T. 1 N., R. 4 E. Represents upper 15 ft. of a 25 ft. bed. **168.** Lower 10 ft. of 25 ft. bed. 170. ½ mi. NE. of Mill Creek, Johnston Co., sec. 6, T. 2 S., R. 5 E., out of a bluff, 15 ft. high and 300-400 yards long in bank of a small ravine. **171.** SE. ¼ NW. ¼ sec. 6, T. 2 S., R. 5 E., Mill Creek, Johnston Co., property of Mill Creek Glass Sand Co. Sample of washed sand. **172.** Sec. 36, T. 2 S., R. 3 E., Nebo, Murray Co. Lower beds of Simpson. **173-181. Oil Creek Section.** On Oil Creek, Johnston Co., sec. 17, T. 3 S., R. 4 E. **173.** 15 ft. of white sand, 1,460 ft. above Arbuckle l. s. **174.** Upper 25 ft. bed of a 45 ft. bed of massive white sand, 1,445 ft. above Aruckle l. s. **175.** Lower 20 ft. of bed mentioned in 174. **176.** 10 ft. bed of hard white sandstone, 1,390 ft. above Arbuckle l. s. **177.** Upper 20 ft. of 45 ft. bed 1,310 ft. above Arbuckle l. s. **178.** Lower 25 ft. of bed mentioned in 177. **179.** 42 ft. bed of white glass sand, 65 ft above Arbuckle l. s. **180.** 5 ft. below top of 34 ft. sand, 5 ft. above Arbuckle l. s. **181.** 2 ft. below top of sand mentioned in 180. Note: Distances above Arbuckle l. s. are stratigraphic, not vertical. **182-183.** sec. 18, T. 2 N., R. 5 E., quarry E. of Roff Pontotoc Co., in bank of Blue Creek. Basal beds of the formation. **182.** Raw sand. **183.** Washed sand. **184-186.** Sec. 15, T. 1 S., R. 7 E., 18 ft. of sandstone bed in bluff on Delaware Creek. Overlain by 25 ft. of l. s. and shale. **184.** 2½ ft. below top of sandstone.

185. 7 ft. below top of sandstone. **186.** 14 ft. below top of sandstone. **187.** NE. ¼ sec. 5, T. 2 S., R. 7 E., near Pilgrim Chapel in Delaware Creek area, Johnston Co. Bed 2½ ft. thick. **188.** 270 yds. E. of NW. corner sec. 26, T. 1 S., R. 7 E., Delaware Creek area, Johnston Co. A 6 ft. bed of white friable sand **189-193.** 355 yds. E. and 255 yds. N. of SW. corner sec. 35, T 1 S., R. 7 E., Johnston Co., **189.** 21 ft. bed, just below l. s. cap of bluff. Massive, white friable sand. **190.** 4 ft. bed 6 in. below the 21 ft. bed mentioned in 189. **191.** 4 ft. bed lying 3 ft. below 4 ft bed mentioned in 190. **192.** 2 ft. bed of rather hard sandstone, just below 4 ft. bed mentioned in 191. **193.** 5 ft. bed of white, friable sand, just below 2 ft. bed mentioned in 192.

194-202. Trinity Sands. 194. SW. ¼ NE. ¼ SW. ¼ and W. ½ of SE. ¼ and all that portion of E. ½ SE. ¼ SW. ¼ sec. 26 that lies W. of St.L. & SF. R. R. right of way all in sec. 26, T. 4 S., R. 5 E., Johnston Co. The lease contains 40 acres. **195.** 2½ mi. N. of Caney, Atoka Co. Bed 10 ft. thick and 55 ft. long in cut of M. K. & T. R. R. **196-197.** ½ mi. NE. of Durwood, extreme NW. corner of Marshall Co. From S. bank of a small

SEDIMENTARY ROCKS (19-258)

SANDS AND SANDSTONES. (145-232)

creek. Sec. 25, T. 4 S., R. 3 E. just over the line in Carter Co. **196.** Raw sand. **197.** Washed sand. **198.** 2 mi. SE. of Durwood, Marshall Co. Lower 5 ft. of a 20 ft. bank in a small ravine. **199-200.** NE. ¼ sec. 29, T. 6 N., R 2 E., ¼ mi. W. of Greenville, Love Co., and 4 mi. S. of Overbrook. In a 25 ft. bluff. **199.** Top 15 ft. of bluff, covered with 3 ft. overburden. **200.** Lower 10 ft. of bluff. **201.** Sec. 27, T. 5 S., R. 5 E., ½ mi. NW. of Public Square of Madill, Marshall Co. Lower 10 ft. of a sand bluff, 25 ft. high and 75 yds. long. **202.** Sec. 31, T. 4 S., R. 5 E., ½ mi. S. of Russett, Johnston Co. From a 15 ft. ledge of sand in a ravine.

203. Whitehorse Sandstone. Near Cement. Caddo Co.

204. Cupriferous s. s, sec. 31, T. 12 N., R. 7 E., Okfuskee Co., 5½ mi. SE. of Prague, Lincoln Co., from a 1½ ft. vein, at least 300 ft. long, and of unknown depth, on lease of E. G. Eby of Wagoner, Okla. Stock pile sample of vein. **205.** Sandstone containing the vein of 204.

206-228. Sandstones from T. 4 N., R. 1 E. (except No. 219), E. of Paoli, Garvin Co., lease of Teepee Queen Copper Co. 206. Red ferruginous s. s., SE. ¼ sec. 18. **207.** Black manganiferous s. s., SE ¼ sec. 18. **208.** Greenish argillaceous s. s., E. ¼ corner sec. 18. Color due to tiny malachite nodules. **209.** Greenish-gray s. s., 300 paces N. of E. ¼ corner sec. 18. **210.** Red argillaceous s. s., 400 paces N. of E. ¼ corner sec. 18. **211.** Cupriferous s. s., NE. ¼ SW. ¼ sec. 18, near pipe line. Composite of a bed 3 ft. 9 in. thick, varying from light gray at top to red at bottom. The layer of malachite nodules at the bottom of this bed was not included in the sample. **212.** Manganiferous s. s., near W. ¼ sec. 18. just E. of road. **213.** Calcareous s. s., ⅛ mi. E. of W ¼ corner sec. 18.

214-216. Black manganiferous s. s., NW. ¼ sec. 18, about 250 paces E. of road. **217.** Malachite s. s.. nodules, SW. ¼ sec. 18 **218.** Malachite in s. s., 2½ mi. E. of Paoli, Garvin Co. at pipe line cut. **219.** Light greenish-gray soft s. s., from center of sec. 36, T. 5 N., R. 1 W. **220.** Light gray soft, saccharoidal s. s., speckled with brown. N. ¼ corner sec. 6. Sample of 2½ ft. of rock. **221.** Dark red sandy soil weathering from a conglomerate ledge, S. ¼ corner sec. 9, where pipe line crosses road, 2½ mi. E. of Paoli.**222-223.** Sandstone with black and green blotches, SW. ¼ SW. ¼ sec. 19, Wiggley Hill. **224.** Light green s. s., with traces of malachite, SW. ¼ SW. ¼ sec. 20. **225.** Sandstone containing oxide of iron and some copper. At old spring S. of shaft.

SEDIMENTARY ROCKS. (19-258)

near Wiggley Hill. **226.** Malachite impregnated s. s., 300 paces E. of N. ¼ corner sec. 18. Out of a square pit dug at pipe line cut. Sample of a 5 ft. cut of stone. **227.** Red ferruginous, and siliceous concretions from creek near center of sec. 18. **228.** Cupriferous s. s., ¼ mi. N. of NW. corner sec. 18., ½ mi. E. of Paoli. 8 ft. thick. ¼

229.—Unnamed "calcareous silica." Sec. 9, T. 20 N., R. 26 W., Ellis Co.

230-231. Unnamed s. s., near Lone Wolf, Kiowa Co. **230.** Sec. 13, T. 7 N., R. 17 W. **232.** Unnamed gypsiferous s.s., SW. ¼ sec. 21, T. 7 N., R. 9 W.

SHALES AND CLAYS. (233-258)

233. NW. ¼ sec. 18, T. 4 N., R. 17 E., quarry of Choctaw Cement Co., Hartshorne, Pittsburg Co., below the Wapanucka ls. **234-235.** Sec. 27, T. 26 N., R. 6 E., 3 mi. E. of Nowata, Nowata Co., at site of British-American Cement Co.'s proposed quarry in valley of Verdigris River. **236-237.** Sec. 7, T. 19 N., R. 12 E., 4 mi. W. of Tulsa, Tulsa Co., at proposed site of Tulsa Portland Cement Co. From underneath the ls. **238-240.** SE. ¼ sec. 15 ,T. 19 N., R. 11 E., I mi, SW. of Sand Springs, Tulsa Co. The shale overlies the ls. **241-243.** T. 27 N., R. 13 E. Quarry of Dewey Portland Cement Co., Dewey, Washington Co. **244.** Center of E. line of sec. 5, T. 26 N., R. 13 E., Washington Co. Sample comes from the point where Bartlesville-Dewey Interurban line turns N. The shale is micaceous, varies from brown to blue, covers a 40 acre area, and is suitable for development. **245.** Secs. 7. 18, 19, T. 23 N., R. 15 E., 3 mi. NW. of Oolagah, Rogers Co. Property of Gunther City Coke, Coal & Mining Co. **246.** Daugherty, Murray Co., property of Continental Asphalt & Petroleum Co., just N. of crusher. The shale is pale yellow; quite plastic, requiring about 35 pct. of water to make a stiff mud; and fuses at about 1000°C. It makes a fair, reddish brick. **247-252.** T. 3 N., R. 5 E., Lawrence, Pontotoc Co. Quarry of Oklahoma Portland Cement Co. **253.** 3 mi. N. of Norman, Cleveland Co. **254.** 4 mi. E. of Ferguson, Blaine Co., in Henquenets' canyon on Salt Creek. Green concretions, so-called "copper ore." **255.** 4 mi. W. of Ferson, Blaine Co., Stuck's Canyon, head of Salt Creek. **256.** Gypsiferous shale, E. Woodward Co., Mt. Heman, Gyp Hills. **257.** White dolomitic arenaceous shale (White Spots), sec. 33, T. 13 N., R. 23 W., near Cheyenne, Roger Mills Co. **258.** Red dolomitic arenaceous shale (Red Spots). In contact with No. 257.

METAMORPHIC ROCKS. (259-261)

MARBLE. (259-261).

259-261. St. Clair Marble. SE. ¼ sec. 14, T. 13 N., R. 23

E., 1 mi. N. of Marble City, Sequoyah Co. Quarry of Western Marble Co. Quarry is 250 ft. high and 100 ft. long. **261.** Representative sample.

MINERALS. **(262-267)**

BARITE. **(262-264)**

262-263. Barite Sand Rosettes. SW. SE. sec. 18, T. 9 N., R. 1 W., 5½ mi. NE. of Norman, Cleveland Co. These "roses" occur in a decomposed red s. s. **264.** Barite Rosettes from E. Okla.

SALT. **(265-266)**

265-266. T. 6 N., R. 26 W., Salton, Harmon Co. **265.** Sec. 3 **266.** Secs. 4 and 11.

SELENITE. **267).**

267. Sec. 10, T. 23 N., R. 17 W., Woodward Co.

ORES. **(268-368)**

COPPER ORES. **(268-275)**

268. Chalcopyrite in brown limonite, ¼ mi. N. of Ada, Pontotoc Co., R. J. Lewis farm. From 8 ft. spring hole.

269. Malachite. SW. ¼ NE.¼ sec. 34, T. 6 N., R. 5 E., near Konawa, Seminole Co.

270-273. Sec. 31, T. 12 N., R. 7 E., Okfuskee Co., 5½ mi. SE. of Prague, Lincoln Co. (see serials 204-205). **274.** Sec. 9, T. 3 N., R. 15 W., near Oriana, Washita Co., Hale Copper Mine. **275.** SE ¼ sec. 7, T. 4 N., R. 16 W., Kiowa Co., Kiowa Copper Co. Hand picked specimens from a vein stringer ½ to 1½ in. thick. Note: see serials 206-228 for analyses of cupriferous sandstones.

IRON ORES. **(276-277)**

276. Sec. 17, T. 1 S., R. 8 E., near Hunton, Coal Co. Prospect No. 1.

277. Hematite. Secs. 1 and 2, T. 4 N., R. 13 W. and secs 7, 17, 20, 21, T. 4 N., R. 12 W., Comanche Co. Ore body is 200 ft. wide runs 35 pct, Fe at E. end of outcrop and 7 pct Fe at fault in sec. 1.

LEAD AND ZINC ORES.**(278-313)**

ARBUCKLE MOUNTAIN LEAD AND ZINC ORES.**(278-291)**

Davis Lead and Zinc Field. **(278-290).**

278-290. Secs. 17, 18, 21, T. 1 S., R. 1 E., Murray Co. **278.** Surface carbonate. **279.** Blend. **280.** Concentrates. **281-286.** Chips from surface carbonates. **287.** Chips from ore selected for milling. **288.** Sample from deeper prospects. **289.** "sample from most important mine." **290.** Concentrates from United Mining & Milling Co. mine.

291. 2 mi. E. of East Timbered Hills. 160 ft. depth.

NORTHEASTERN OKLAHOMA LEAD AND ZINC ORES
(292-303) OTTAWA CO.
Lincolnville (Quapaw) Camp. (292-294).

292-293. T. 28 N., R. 23 E.292. Concentrates from Mission Mine, NE. ¼ sec. 1. "Dirt" occurs at 50 ft. and runs 30 pct. concentrates.

293. Concentrates from old M.K.&T. ("Katy") Mine, SW. ¼ sec. 36. 294. Concentrates from Big Jack Mining Co. mine, NE. ¼ sec. 6, T. 28 N.,, R. 24 E. On 107 ft. level The "dirt" runs 6 pct. concentrates with sphalerite: galena : : 8:1.
Miami Camp. (295-303).

295. Concentrates from Joplin area. Average of 45,000 shipments made from 1900 to 1913. 296. Concentrates from tri state district. Average of 3,800 shipments made in 1904.

297. Concentrates from New State Mine, 4-5 mi. N. of Miami. Ottawa Co.

298. Concentrates from tailing mill at New State Mine. 299. Lead concentrates from New State Mine. 300. Cuttings from Sullivan Lease at 200-250 ft. depth. 301. Concentrates from Emma Gordon Lease. 302. Concentrates from Golden Hen Lease. 303. Composite of 3,800 shipments from tri-state district marketed in 1904.

SOUTHEASTERN OKLAHOMA LEAD AND ZINC ORES.
OUACHITA MTS. (304-305).

304-305. N. ½ N. ½ sec. 15, NW. ¼ NW. ¼ sec. 14, and S. ½ N. ½ sec. 14, T. 2 S.. R. 26 E., McCurtain Co. 304. From 18 ft. depth in Shaft No. 2. 305. Dump of shaft No. 4.

SOUTHWESTERN OKLAHOMA LEAD AND ZINC ORES.
WICHITA MTS. (306-313).

306. Clark & Bennett (Galena) Mine, sec. 16, T. 3 N., R. 14 W., Comanche Co. Sample from dump.

307-313. Starley Mine. (A few mi. NW. of Lawton, Comanche Co.). Shaft is 70 ft. deep. 307. Lead ore, 5 ft. from surface. 308. 12 ft. from surface. 309. 22 ft. from surface. 310. 34 ft. from surface. 311. 44 ft. from surface. 312. 65 ft. from surface. 313. 70 ft. from surface.

MANGANESE ORES. (314-359).

314-328. Bromide, Johnston Co., secs. 13 and 14, T. 2 S., R. 7 E., Springbrook deposits, 4 mi. SW. of Bromide.

329-354. Hunton, Coal Co., sec. 17, T. 1 S., R. 8 E., Moseley Creek Deposits. 329-334, and 354 are from "Prospect No. 6." SE. ¼ sec. 17, 1½ mi. S. of Hunton. No. 354 represents the quality of ore remaining after the removal of the 17 car lots of

197 tons total, the compositions of which are represented by Nos. 329-334. No. 352 represents ore from "Prospect No. 4."

355-358. Ouachita Mts., McCurtain Co., SW. ¼ sec. 16, T. 3 S., R. 26 E. **359.** Ouachita Mts., Eagletown, McCurtain Co., SW. ¼ sec. 16, T. 5 S., R. 27 E.

SILVER AND GOLD ORES. **(360-367).**

360. Sec. 31, T. 12 N., R. 7 E., Okfuskee Co. 5½ mi. SE. of Prague, Lincoln Co.

361. Sec. 18, T. 8 N., R. 15 E., near Indianola, Pittsburg Co., W. White Newberry farm., Black sand. **362-364.** SW. ¼ sec. 16, T. 3 S., R. 26 E., in manganese ore (?). **362-363,** At depth of 12 ft. **365.** Parker Mine in Wichita Mts. "This mine is located not far from the edge of the granite area, lying N. of Quanah Parkers' in the granite country. There is no evidence of a vein. The granite shows small pieces of chalcopyrite sprinkled throughout rock but not in quantity." **366-367. 366.** See No. 306. **367.** See No. 313.

PHOSPHATE ROCK. **(368).**

368. Phosphate Nodules. SE. ¼ sec. 33, T. 4 S., R. 9 W., 8 mi. W. of Waurika, Jefferson Co. and ¼ mi. N. of Burkburnett road, just W. of Cotton-Jefferson Co. line, about 1 mi N. of Red River and about 2 mi. E. of Wallings' store. The nodules are included in a maroon colored shale, about half way up the W. facing bluff of hill upon which Mr. Silkwoods' house stands (1922).

HYDROCARBON COMPLEXES. **(369-1178)**

ASPHALTIC BITUMENOUS ROCKS. **(369-407).**

ARBUCKLE MOUNTAIN REGION. **(369-397).**

369-370. Ada, Pontotoc Co., 1½ mi. W. of. Holdings of D. A. Herring. the sand asphalt occurs on an 100 acre hill and has a thickness of 80 ft. The raw material has been used as surfacing, and the weathered stripping as foundation in the asphalt paving at Lawton.

371-379. Brunswick District. W. ½ sec. 25, all of sec. 26, SW. ¼ sec. 29, SE. ¼ sec. 30, T. 1 S., R. 3 E., 4 mi. NE. of Dougherty, Murray Co., immediately N. of Rock Creek. **374-375.** Bituminous sand as shipped. **376-378.** Free bitumen in small seams of a hard compact, somewhat crystalline limestone. **379.** SW. ¼ sec. 29, and SE. ¼ sec. 30.

380-387. Buckhorn District, T. 1 S., R. 3 E. **380.** SE. ¼ SE. ¼ sec. 23, Gilsonite Roofing and Paving Co. Quarry No. 2 at SE. end of district. **381.** Lime asphalt near Buckhorn. **382.** Same as 380. 385. SE. ¼ SE. ¼ sec. 17, 2 mi. W-NW. of Schley, center sec. 22, in bluffs of Rock Creek. **386.** SW. ¼ SE. ¼ sec. 21.

NE. of Doughmerty, Murray Co., Gilsonite Roofing and Paving Co., Quarry No. 4 at W. end of district in Viola ls. **387.** Kirby Mine, NW. ¼ sec. 22.

388. Elk Asphalt Co. center of T. 1 S., R. 2 W., near Elk NW. Carter Co. Soft maltha.

389. Emet, Johnston Co., 5 mi. SE. of. Sec. 32 (?) T. 4 S., R. 8 E. Maltha.

390-396. Ravia, Johnston Co., 3½ mi. w. of. NE. ¼ sec. 1, T. 4 S., R. 4 E. Bitumenous ls.

397. Sneider Deposit. N. line sec. 18, T. 3 S., R. 1 E., 4 mi. SE. of Woodford, Carter Co., just E. of Henryhouse Creek in Springer member of Glenn Formation. Bitumenous sand.

ARDMORE REGION. **(398-400).**

398-400. Ardmore, Carter Co. **398-399.** NE. ¼ NW. ¼ sec. 21, T. 4 S., R. 2 E. 5 mi. NW. of Ardmore. Sand asphalt. **399.** Quarry is 35 ft wide and 40 ft. deep.

400. Sec. 26, T. 5 S., R. 1 E., 5 mi. S. and 3 mi. W. of Ardmore. Quarry is 440 yds. long and 30 yds. wide. It lies along a fault.

OUACHITA MOUNTAIN REGION. **(401-402).**

401-402. Sec. 22, T. 6 S., R. 21 E., near Valliant, McCurtain Co., at crossing of T, O, & E and Frisco R.Rs. Ledge is 70 ft. thick and very long. Owned by H. C. Clark of Valliant or Glover. Sand asphatl.

QUAPAW REGION. **(403-404).**

403-404. Quapaw Indian Reservation in extreme NW. corner of Ottawa Co. In Chester s. s. Maltha. Causes trouble in jigging ore in Miami district.

WICHITA MOUNTAIN REGION. **(405-407).**

405. Shale asphalt near Lawton, Comanche Co. **406.** Sand asphalt, Lawton.

407. Sand asphalt, Elgin, Comanche Co.

ASPHALT PYROBITUMENS. **(408-416).**

GRAHAMITES. **(408-416).**

408. Black Fork Mt., S. ½ sec 24, T. 3 N., R. 26 E., 2 mi. E. of Page, LeFlore Co. 10 ft. thick. **409-411. Impson Valley. 409.** W. ½ sec. 28, T. 1 S., R. 15 E., NW. of Antlers, Pushmataha Co. **410-411.** SW. ¼ sec. 21 and NW. ¼ sec. 28, T. 1 S., R. 14 E., Ten Mile Creek District. Jumbo or Choctaw or Old Slope Mine. **412-413.** Jackfork Creek, SE. ¼ NE. ¼ sec. 9, T. 2 N., R.18 E., 12 mi. W. of Tuskahoma, Pushmataha Co. **414.** Loco. Stephens Co. 6 mi. N. of., NW. ¼ sec. 6, T. 2 S., R. 4 W. **415-416.** McGee Creek, Atoka Co. **415.** SW. ¼ sec. 23, T. 1 N., R. 14 E., 15 mi. NW. of Antlers, Pushmataha Co. at Williams Mine. The

grahamite occurs in two small veins, 4 in. and 12 in. thick. **416.** NE. ¼ sec. 25, T. 1 S., R. 13 E. and NW. ¼ sec. 30, T. 1 S., R. 14 E., about 12 mi. SE. of Stringtown, Atoka Co., Pumroy or Moulton Mine. Vein analyzed is ¼ mi. S. of location given and is about 2 ft. thick.

Coals, Distillation Tests On. **(417-420).**

417. Henryetta nut coal. **418.** Briar Creek lump coal from mine of McAlester Fuel Co. at Iehigh, Coal Co. **419.** Semi-anthracite. **420.** Kali Inla lump coal from mine of McAlester Fuel Co. at Wilburton, Latimer Co.

Miscellaneous Pyrobitumenous Materials, Distillation Tests On. **(421-432).**

421. Shale from Burning Mountain near Crusher, Murray Co. ncluded in Woodford chert. **422.** Woodford chert W. of Davis, Murray Co. The chert is impregnated with bitumen. **423.** Shale, bottom of Caney. On Cool Creek, ¼ mi. above Santa Fe R. R. bridge at Arbuckle Switch near Crusher, Murray Co. **424.** Shale. Upper ½ of an 80 ft. bed of Caney. Shale lies above a black s. s. and below a yellow one and is located 100 yds. S. of Cool Creek R. R. bridge. **425.** Shale from along Cool Creek, just below Santa Fe R. R. bridge over the Washita River(about 2½ mi. S. of Crusher. **426.** Shale, Caney. From Spring at Geology Camp of Oklahoma University, on the Washita River at Arbuckle Switch near Crusher. **427.** Same as 424. **428-429.** Shale, Caney. Sec. 33, T. 2 S., R. 3 E. From foot of bluff on Jericho Creek, farm of Frank Denmark, Arbuckle Mts. **430.** Lignite from Dakota s. s., Cimarron Co. **431.** "Impsonite," a Grahamite from sec. 28, T. 1 S., R. 15 E., Jumbo Asphalt Mine., NW. of Antlers, Pushmataha Co. **432.** Asphaltic sand, sec. 22, T. 6 S., R. 21 E., McCurtain Co.

COALS. **(433-874).**

CRETACEOUS COALS. **(433-435).**

433. Center sec. 19, T. 4 N., R. 1 E., Cimarron Co. in Dakota s. s. Includes all impurities. Bed is 5 ft. thick. **434.** Same as No. 433 except all impurities were removed. 30 in. bed of lignite. **435.** Sec. 33, T. 4 N., R. 1 E., Will Baker Ranch. In Dakota s. s. Clear lignite, 1 ft. 6 in. thick.

PENNSYLVANIAN COALS. **436-874).**

CHEROKEE-CREEK OR NORTHERN COAL FIELD. **(436-486).**

Dawson Coals. (436-449).

436-439. Broken Arrow. 436. NW. part T. 18 N., R. 15 E., SE. of Broken Arrow, Tulsa Co. **437.** Mine sample. **438.** Sec. 15, T. 18 N., R. 15 E. 3½ mi. NE. of Broken Arrow. Arkansas Valley Strip Pit. Bed is 2 ft. thick. Sampled 12/19/'14.

440-443. Collinsville, Rogers Co., T. 22 N., R. 14 E., **440-442.** 1 mi. N. of Collinsville, Center of T. **442.** "Red Coal." **443.** ½ mi. N. of Collinsville, sec. 21, face of New State Strip Pit. Bed is 1 ft. 9 in. thick. Sampled 12/10/'14.

444. Dawson, Tulsa Co., ½ mi. W. of Sec. 28, T. 20 N., R. 13 E., South Western Mine No. 1. 500 ft. N. of slope mouth. Bed is 2 ft. thick. Sampled 12/9/'14.

445-446. Scales, E. of Eulsa, Tulsa Co., sec. 10, T. 19 N., R. 13 E. **445.** Mine sample. **446.** Car sample of mine run coal..

447-449. Tulsa, Tulsa Co. **447.** SE. of Tulsa. Mine sample. **448.** S. of Tulsa, SW. ¼ SE. ¼ sec. 30, T. 18 N., R. 12 E. Drill sample. **449.** 4 mi. SW. of Tulsa, sec. 17, T. 19 N., R. 13 E., Hickory No. 2 Mine. 300 ft. SE. of shaft. Bed 2 ft 6½ in. thick. Sampled 12/9/'14.

Henryetta Coals. (450-472).

450-453. Dewar, Okmulgee Co. **450.** Henryetta Mine. **451.** Average of 10 analyses on 403 tons of lump coal over a 2 in. screen. Sampled '11 and '12. **452.** Average of 4 analyses on 224 tons of lump coal. **453.** Average of 5 analyses on 274 tons of run of mine coal. Sampled '14 and '15.

454-459. Creek Coal & Mining Co., Mine No. 1, NW ¼ SE. ¼ sec. 15, T .11 N., R. 12 E., Okmulgee Co. **454.** Mine run coal. **455.** Mine sample. **456.** 100 lb. sample of egg coal. **457.** 2,000 lb. block representing full thickness of bed. On display at Mineral Building at Oklahoma State Fair at Oklahoma City.

459. Coal dust from Main E. roadway.

460-464. Victoria Coal Co., Mine No. 1, NE. ¼ NW. ¼ sec. 28, T. 11 N. R. 12 E., 4¾ mi. W. of Henryetta, Okmulgee Co. **460.** Mine sample. **461.** Car load of mine run coal. **463.** 33½ in. cut, in W. entry; 1,200 ft. from shaft. Sampled 3/16/'10. **464.** 34 in. cut from main E. entry.

465-470. Whitehead Coal & Mining Co., Mine No. 1, (now Henryetta No. 1). **465.** Mine sample of 2 ft. 11½ in, face in NE. entry. **466.** SE. entry. **467.** 40 ton car sample. **468.** Mine run coal; Bright; lumps, 20 pct.; small, 40 pct.; slack, 40 pct. **469.** Mine run coal. **470.** Unwashed lump and slack coal. Non coking.

471-472. Henryetta, Okmulgee Co. **471.** Average of 4 analyses on 241 tons of lump coal. Sampled '13 and '14. **472.** Average of 13 analyses on 1,682 tons of mine run coal. Sampled '14 and '15

Unclassified Beds. (473-486).

473-475. Bluejacket, Craig Co. **473.** W. of Bluejacket. **474.** Coates Mine, 4 mi. W. of Bluejacket. **475.** Sec. 26, T. 27 N., R. 20 E., Jas. Coates Mine. Off E. side, main entry; 300 ft. from mouth. Coal is 3 ft. 1 in. thick. Sampled 12/13/'14.

476-477. Catale, Rogers Co., 1 mi. NE. of. Catale No. 1 Mine, sec. 14, T. 24 N., R. 18 E. 300 ft. NW. of shaft. Coal is 1 ft 10 in. thick. Sampled 12/15/'14.

478. Chelsea, Rogers Co., 4½ mi. W. of. Center T. 24 N., R. 17 E.

479-481. Claremore, Rogers Co. **479.** Under W. side addition to Claremore. **480-481. McNutt Mine.** 5 mi. NE. of Claremore. sec. 22, T. 22 N., R .16 E. **480.** 50 ft. N. of slope mouth. Coal is 1 ft. 7 in. thick. 25 ft. overburden. Sampled 12/17/'14

482. Estella, Craig Co., 1 mi. E. of Sec 33, T. 26 N., R. 19 E. Face of Wm. Boot Strip Pit. Coal is 2 ft thick. Sampled 12/14/'14.

483. Hanson ,Sequoyah Co.. 1 mi. N. of. Sec. 6, T. 11 N., R. 25 E. Jas. Brewer et al. Strip Pit. Coal is 1 ft thick. Semi-bitumenous. Ash softens at 2,170°F. Sampled at N. end of pit on 11/2/'16.

484. Red Bird, Wagoner Co., 1¼ mi. NE. of. Face at Ed Kirk Strip Pit. Coal is 9½ in. thick. There is a charcoal layer 2 in| below top o fbed. Coal ash softens at 2,080°F. Sampled 10/20/'16.

485. Vinita, Craig Co., 10 mi. NW. of. Sec. 13, T. 26 N., R. 19 E. Heldebrand Strip Pit. Coal is 2 ft. 3 in. thick. Sampled 12/14/'14.

486. Welch, Craig Co., 4 mi. W. of. Sec. 28, T. 28 N., R. 20 E. Face of J. A. Mills Strip Pit. Sampled 12/12/'14.

CHOCTAW OR SOUTHERN FIELD. **(487-874).**

Lower Hartshorne Coal. **(487-653).**

487-501. Adamson, Pittsburg Co. **487-489.** 1½ mi. E. of Adamson. Eclipse No. 1 Mine. Sec. 9, T. 5 N., R. 17 E. **487.** Face of E. entry; 3,600 ft. NE. of slope mouth. 4½ ft. bed. Sampled 1/30/'13. Represents run of mine. **488.** Face of W. entry; 3,600 ft. NW. of slope mouth. 4 ft bed and cut. **489.** Composite of 487 and 488. **490-492.** Union Coal Co., Mines Nos. 3 and 4. SW. ¼ sec. 7. T. 5 N., R. 17 E. **490.** Standard sample. **491.** Lump coal. **492.** Mine sample. **493.** Average of 8 analyses on 1,408 tons of lump coal over a 1½ in. screen. Sampled in '13 and '14. **494.** Average of 12 analyses on 981 tons of lump coal over a 1 in. screen. Sampled in '11 and '12. **495-497.** 3 mi. E. of Adamson, at drum station, Adamson Mine No. 6 in Latimer Co. **495.** Face of 2 W. entry; 460 ft. NE. of mine opening. Coal is 4 ft. thick. Sampled 1/28/'15. **496.** Face of 2 E. entry; 400 ft. NE. of opening.

497. Composite of 495 and 496. **498-501.** ¼ mi. S. of Adamson, Adamson Mine No. 4. **498.** Face of 9 E. entry; 1,200 ft. NE. of opening. Coal is 4 ft. 3 in. thick. Sampled, 7/7/'14.**499.** Face of

10 E. entry; 1,250 ft. NE. of opening. Coal is 4 ft. 3 in. thick **500.** Face of 10 W. entry; 1,300 ft. NW. of opening. Coal is 4 ft. 1 in. thick. **501.** Composite of 498-500.

502-507. Bokoshe, LeFlore Co. **502-504. Bokoshe Smokeless Coal Co. 502.** Mine No. 3, NW. pt. T. 8 N., R. 24 E. Lower Panama bed. Nut and slack. **503.** Mine No. 7, W. of Bokoshe. Mine run. **504.** Mine No. 4 at Bokoshe. Mine run. **505-506.** ½ mi. NE. fo Bokoshe, T. 8 N., R. 24 E. Slope Mine No. 3. Semi-bituminous coal. Mine coal. Mine sample. Ash softens at 2,230°F. **505.** Face of 5 entry, off slope; 1,700 ft. E. of mine mouth. Coal is 2 ft. 10 in. thick, in a bed 6 ft. 5 in. thick. It is the upper seam. Sampled 11/3/'16. **506.** Bottom seam of No. 505. Coal is 3 ft 7 in. thick. **507.** Average of 8 analyses on 350 tons of mine-run-coal. Sampled '11 and '12.

508-510. Buck, Pittsburg Co. Buck No. 6, Pres, Allen et al. NW. ¼ sec. 12, T. 5 N., R. 15 E., 2 mi. E. of Krebs, old Hughes Mine No. 12. Ash, red-brown. Coke slightly swollen. **509.** Room 16. off main N. level; 600 ft. N. of shaft. 53 in. cut. **510.** Room 2, 1st S. plane, 400 ft. S. of shaft. 53 in. cut.

511. Cavanal, LeFlore Co., ¾ mi. N. of. Sequoyah Coal & Mining Co. mine. (old Crescent Coal & Mining Co.) in W. side of sec. 17, T. 6 N., R. 25 E. Coking coal.

512. Carbon, Pittsburg Co. Sec. 6, T. 5 N., R. 16 E. Central mine. 3 ft. cut. Sampled, '05.

513. Chant, Haskell Co., ½ mi. E. of. Sans Bois No. 2 Mine. sec. 23, T. 8 N., R. 22 E. S. entry No. 10. 2,700 ft. SE. of opening. 78 in. cut.

514-521. Degnan, Latimer Co., ¾ mi. W. of. **M, K, & T Mine No. 19. 514.** Mine sample from face of 3 E. entry, off main slope. Coal is 5 ft. 9⅝ in. thick. Sampled 6/19/'18. **515.** Face of 2 E. entry, off inside plane entry. Coal is 5 ft 3 in. thick. **516.** Face of 4 E. entry, off main slope entry. Coal is 5 ft. 7⅛ in. thick. **517.** Face of 5 E. entry, off main slope entry. Coal is 6 ft. ¾ in. thick. **518.** Face of 1 E. entry, off inside plane entry. Coal is 6 ft. 4½ in. thick. **519.** Tipple sample of lump coal, over 2½ in. screen. Sampled 6/19/'18. **520.** Tipple sample of nut coal through a 2½ in. screen and over a 1¼ in. screen. **521.** Tipple sample of slack coal through 1¼ in. screen.

522. Dwight, Pittsburg Co. Kali Inla Coal Co., Mine No. 1, secs, 21, 22, 27 28, T. 5 N., R. 17 E. Coal cokes, does not clinker and ash is pale buff in color.

523-533. Gowen, Latimer Co., **Rock Island Coal & Mining Co. 523.** Mine No. 3. Coal cokes, does not clinker and ash is pale buff in color. **524-533.** Mine N. 40, secs. 22, 23, 26, 27, T. 5 N., R. 17

E. **524-525.** SE. ¼ SE.¼ sec. 23. **526-533.** 1 mi. W. of Gowen. **526.** Face of room 5, 9 W. entry off 41 slope entry. Coal is 3ft. 4½ in. thick. Ash softens at about 2,030°F. Sampled 3/14/'18. **527.** Face of room 15, 7 W. entry, off 41 slope entry. Coal is 4 ft. 5½ in. thick. **528.** Face of 8 E. entry, 41 slope entry. Coal is 4 ft. ¼ in. thick. **529.** Face of room 50, 6 W. entry, 40 slope entry. Coal is 4 ft. 1/16 in. thick. **530.** Face of 5 E. air course, off 41 slope entry. Coal is 7 ft. 3/32 in. thick. **531.** Face 6 E. entry, 41 slope entry. Coal is 3 ft. 10 1/16 in. thick. **532.** Face of 5 W. entry, 41 slope entry. Coal is 4 ft. 1 3/32 in. thick. **533.** Composite of 526-532.

534-538. Haileyville, Pittsburg Co., **Hailey Ola Coal Co. 534.** Mine No. 1, secs. 1 and 2, T. 4 N., R. 16 E. and secs. 35 and 36, T. 5 N., R. 16 E. Coal is 4 ft. 6 in. thick. Mine sample. **535.** 600 lb. block of coal 18 in. wide. **536.** Mine No. 2, NE ¼ sec. 11. T. 4 N., R. 16 E. SW. of Haileyville .Mine sample. **537.** Coal cokes, clinkers slightly, and its ash is pale buff in color. **538.** Mine No. 3, SE. ¼ sec. 2, T. 4 N., R. 16 E. Coal cokes, does not clinker and its ash is pale buff in color.

539-541. Haileyville, Pittsburg Co., 1½ mi. S. of. Blue Creek Mine No. 7. T. 5 N., R. 17 E. **539.** Face of 1 S. entry, main slope entry. Coal is 3 ft. 8¼ in. thick. Ash softens at about 2.030°F. Sampled 4/12/'18.**540.** Face of 1 N. entry, main slope entry. Coal is 5 ft 7⅝ in. thick. **541.** Composite of 539-540.

542-561. Hartshorne, Pittsburg Co. **542-554. Rock Island Coal Co. Mine No. 8**, SE. ¼ SE¼. sec. 36, T. 5 N., R. 16 E., and sec. 31, T. 5 N., R. 17 E. **542-551.** SE. ¼ SE. ¼ sec. 36, T. 5 N., R. 16 E. **542.** Room 14 off main E. entry. Coal is 4 ft. 5½ in. thick. Mine sample. **543.** Room 16, off 7 W. entry. Coal is 3 ft. 10 in. thick. Mine sample. **544.** 20 ton car sample of mine run coal. **545.** Sample for boiler tests. **546.** Sample for coke test. 9,000 lbs. of unwashed coal yielded 5,725 lbs. of coke; 580 lbs. of ash and breeze. The coke was soft, shattered and brittle. It was somewhat high in sulphur. **547.** Washed coal for coke test. The washed coal contained more moisture but 1/3 less ash. On burning 65 hrs it produced better coke than the unwashed coal except that the sulphur was higher. **548.** Slack from car sample. This passes a ⅝ in. screen. **549.** Lump coal passing over a 1 in. screen. **550.** E. air course No. 8; 4,100 ft. W. of shaft. 48½ in. cut. Mine sample. **551.** Coal cokes, does not clinker, and its ash is light buff in color. **552-554.** 1 mi. NW. of Hartshorne, sec. 31. T. 5 N., R. 17 E. **552.** 1,800 ft. NW. of shaft. Coal is 4 ft. 5 in. thick. Sampled 7/22/'14. **553.** 2,000 ft. NE. of shaft. Coal is 4 ft. 9¼ in. thick. **554.** 2,300 ft. NE. of shaft. Coal is 3 ft. 10 in. thick.

555-559. 1 mi. E. of **Hartshorne, Rock Island Coal Mining Co. Mine No. 7,** center of NE ¼ NE. ¼ sec. 12, T. 4 N., R. 16 E. **555.** 3rd E. entry. Coal is 3 ft. 10 in. thick. **556.** Carload of slack coal. **557.** 4,500 lb. block of coal, representing the full thickness of bed, on exhibition at Mineral Building of Oklahoma State Fair at Oklahoma City. **558.** Car load of lump coal. **559.** Coal cokes does not clinker and its ash is pale buff in color. **560-561.** Hartshorne No. 1. **561.** Car load lot. Coal yields a lustrous unswollen coke with dull black patches. The ash is reddish brown.

562. Heavener, LeFlore Co., 2 mi. SE. of. Sec. 28, T. 5 N., R. 26 E. Milby & Dow Co. The coke produced is lustrous, firm, and swollen to several times the volume of the original coal.

563-571. Howe, LeFlore Co. **563-564.** 1½ mi. SW. of Howe, E. side of sec. 3, T. 5 N., R. 25 E., Mexican Gulf Coal & Transportation Co. Mine No. 1, Potter camp. Coal yields a lustrous, firm coke, swollen to several times the volume of the original coal. **565.** 2 mi. S. of Howe, S. ½ sec. 2, T. 5 N.. R. 25 E. 45 in. cut. Sampled '05 .**566-569.** 3 mi. SW. of Howe, Howe-McCurtain Mine No. 3. **566.** Face of 4 W. entry, main slope entry. Coal is 3 ft. 5 11/16 in. thick. Sampled 6/15/'18. **567.** Face of 6 W. entry Coal is 3 ft. 5⅛ in. thick. **568.** Face in room 30. 5 entry, main slope. Coal is 3 ft. 1 in. thick.**569.** Tipple sample of mine run coal. **570.** Average of 5 analyses of 305 tons of run of mine coal. **571.** From Howe.

572-575. Hughes, Latimer Co. **572.** 1 mi. SW. of Hughes. Hughes Mine No. 2, sec. 4, T. 5 N., R. 22 E. Room 20, W. entry 4, NW. of slope mouth. 42½ in. cut. Sampled 3/8/'10. **573.** 2 mi. SW. of Hughes, E. ½ sec. 4. T. 5 N., R. 22 E. 46 in. cut. Sampled in '05. **574-575.** Turkey Creek Coal Co. Mine No. 2, sec. 35, T. 6 N., R. 22 E.

576. LeBos, LeFlore Co. (?). LeBosquet Coal & Mining Co. Mine No. 2, sec. 2, T. 5 N., R. 22 E.

577-582. Lutie, Latimer Co. Hailey-Ola Coal Co. **577-579.** Mine No. 1, SE. ¼ sec. 11, T. 5 N., R. 19 E. 65 in. cut. Mine sample. Buff colored ash does not clinker. **580-582.** Mine No. 4, SE. ¼ sec. 12, T. 5 N., R. 19 E. Coal cokes, does not clinker, and its ash is pale buff in color. **581.** Fresh face near end of main slope, 1,200 ft, from its mouth. Coal is 5 ft. 4 in. thick.

583. McAlester, Pittsburg Co. Valley Mine No. 2. Sampled '05.

584-606. McCurtain, Haskell Co., sec, 21, T. 8 N., R. 22 E. **584-589. Sans Bois Coal Co. Mine No. 2. 584.** Face of S. entry 13. 5,000 ft. W. of slope mouth. Coal is 5 ft. 8⅞ in. thick. Mine sample. **585.** Face of room 3, off N. entry 13; top side 5,000 ft. W. of slope mouth. Coal is 5 ft. 7¾ in. thick. **586.** Face of S. entry

11; 50 ft. from slope, 5,000 ft. W. of slope mouth. Coal is 5 ft. 6 in. thick. Mine sample. **587.** Face of S. entry 12, top side, 5,500 ft. W. of slope mouth. Coal is 5 ft. 8¾ in. thick. **588.** Neck of room 6, off N. entry 12, top side, 5,300 ft. W. of slope mouth. Coal is 5 ft. 4 in. thick. Mine sample. **589.** Composite sample of 584-588. **590.**. Sans Bois Coal Co. Mine No. 1. Mine sample. **591-594.** 1 mi. NW. of **McCurtain, Blue Ridge Mine No. 3. 591.** Face of 7 W. entry, main slope entry. Coal is 3 ft. 10 in .thick. Sampled 6/1/'18. **592.** Face of 6 W. entry, main slope entry. Coal is 4 ft. 2in. thick. **593.** Face of 7 E. entry, main slope entry. Coal is 3 ft. 9 in. thick. **594.** Face of 6 E. entry. Main slope entry. Coal is 3 ft. 8 in. thick. **595-597.** 1 mi. W. of **McCurtain, Blue Ridge Mine No. 5. 595.** Face of 2 W. entry, main slope entry. Coal is 5 ft. 10 in. thick. Ash softens at about 2,120°F. Sampled 12/21/'17. **596.** Face of room 3, 2 E. entry, main slope entry. Coal is 5 ft. 10 in. thick. **597.** Composite of 595 and 596. **598-606.** 1¼ mi. W. of **McCurtain Blue Ridge Mine No. 4. 598.** Left N. rib, 40 ft. from face of main slope. Coal is 4 ft. 3 in. thick. Ash softens at about 2,140°F. Sampled 12/21/'17. **599.** Face of 4 W. entry, main slope entry. Coal is 4 ft. 2½ in. thick. **600.** Composite of 598 and 599. **601.** Face of 5 E. entry. main slope entry. Coal is 3 ft. 9¼ in. thick. Sampled 6/3/'18. **602.** Face of 4 W. entry, main slope entry. Coal is 3 ft. 11¼ in. thick. **603.** Face of room 5, 4 E. entry, main slope entry. Coal is 4 ft. 2 in. thick. **604.** Face of 5 W. entry, main slope entry. Coal is 4 ft. ¼ in. thick. **605.** Composite tipple samples of lump coal over a 1 in. bar screen. Sampled 6/10/'18. **606.** Slack coal through 1 in. bar screen.

607-612. Panama, LeFlore Co. **607.** Ozark Coal & Railway Co. Mine, sec. 21, T. 8 N., R. 25 E. Coal yields a lustrous, firm and greatly swollen coke. **608-609.** Doubleday Mine, sec. 7, T. 8 N., R. 27 E. of Kansas & Texas Coal Co. **608.** Top vein. **609.** Lower vein. **610.** Mine run coal. **611-612.** W. of Panama, Panama Coal Co. Mine 2, sec. 21, T. 8 N., R. 25 E. Mine run.

613-621 .Pocahontas, Pittsburg Co. **613-615.** Pocahontas No. 2, SE. ¼ NW. ¼ sec. 8, T. 5 N., R. 17 E. **613.** Mine sample. **614-615.** Lump coal. **616-621.** Pocahontas Mine No. 1, 3 mi. W. of Haileyville. **616.** Face of 8 W. entry, 1 650 ft. SW. of opening. Coal is 3 ft. 4 in. thick. Sampled 7/23/'14. **617.** Face of room 6, 7 E. entry, 1,350 ft. SW. of opening. Coal is 3 ft. 4½ in. thick. **618.** Face of room 12, 8 E. entry, 1 850 ft. SW. of opening. Coal is 3 ft. 6 in. thick. **619.** Face of room 10; 7 E. entry, 1,700 ft. SE. of opening. Coal is 4 ft. 4¾ in. thick .**620.** Face of main slope.

622-627. Red Oak, Latimer Co. **622.** Bache-Denman Coal Co., Mine No. 1, sec. 31, T. 6 N., R. 21 E. **623.** Oak Ridge Coal Co.,

1,800 ft. S. of opening. Coal is 3 ft. 3½ in. thick. **621.** Composite of 616-620.

sec. 34, T. 6 N., R. 21 E. **624-627.** Hilling Mine No. 2, 3½ mi. SE. of Red Oak. **624.** Face of 2 E. air course, main slope entry. Coal is 4 ft. ¾ in. thick. Sampled 6/24/'18.**625.** Face of E. plane, main slope. Coal is 4 ft. 1⅜ in. thick. **626.** Face of 1 E. entry, main slope entry. Coal is 4 ft. 4⅜ in. thick. **627.** Composite tipple sample of coal being loaded. Sampled 6/24/'18.

628-633. Ridgeway, Pittsburg Co., ½ mi. E. of. Sec. 33, T. 5 N., R. 17 E., Rock Island Mine No. 10. **628.** Face of main E. entry. Coal is 3 ft. 10 in. thick. Ash softens at about 2,050°F. Sampled 3/8/'18. **629.** Face of main W. entry. Coal is 2 ft. 6 in. thick. **630.** Face of room 27, main W. entry. Coal is 3 ft. 10 in. thick. **631.** Face of E. air course, main N. entry. Coal is 4 ft. 4 in. thick. **632.** Face of 6 E. entry, main S. entry. Coal is 4 ft. 9 in. thick. **633.** Composite of 628-632.

634. Savanna, Pittsburg Co., 1 mi. SE. of. Bore hole No. 2, tract 69, NE. ¼ SE. ¼ sec. 16, T. 4 N., R. 14 E. Coal is 3 ft. 10 in. thick. Sampled 1/x/'08.

635-641. Wilburton, Latimer Co. **635.** 1 mi. W. of Wilburton. Mine No. 7, sec. 8, T. 5 N., R .19 E. Coal is 46 in. thick. **636-637.** Great Western Coal & Coke Co. **636.** Mine No. 3. SE ¼ sec. 9, T. 5 N., R. 19 E. Fancy lump. **637.** Mine No. 2, S. ½ sec. 10, T. 5 N., R. 19 E. **638.** Degnan-McConnell Coal Co., Mine No. 6, SW. ¼ SE. ¼ sec. 8, T. 5 N., R. 19 E. Mine run coal. **639.** M, K, & T Coal Co., Mine No. 19, SW. ¼ NW. ¼ sec. 36, T. 6 N., R. 18 E. Mine run coal. **640-641.** W. side of Wilburton, E. part of sec. 8, T. 5 N., R. 19 E. Lower slope of McAlester Coal & Mineral Co.

642-653. Williams, LeFlore Co., 1 mi. W. of Williams Mine No. 1, sec. 16 (?), T. 8 N., R. 26 E. **642.** Face of 6 W. entry, main slope entry. Coal is 3 ft. 7 1/16 in. thick. Ash softens at 1,870-2,020°F. Sampled 6/12/'18. **643.** Face of 7 W. entry, main slope entry. Coal is 4 ft. 2 1/16 in. thick. **644.** Face of 8 W. entry, main slope entry. Coal is 3 ft. 10⅜ in. thick. **645.** Composite tipple sample of lump coal over a 2½ in. screen. Sampled 6/12/'18. **646.** Composite tipple sample of nut coal through a 2½ in. and over a 1¼ in. screen. **647.** Tipple sample of slack coal through a 1¼ in. screen. **648.** Face of room 2, main slope, 1,500 ft. SE. of entrance. Coal is 2 ft. 11 in. thick. Sampled 7/7/'14. **649.** Face of room 25, 6 W. entry, 1,500 ft. S. of opening. Coal is 3 ft. 11¾ in. thick. **650.** Face of room, 2, 5 E. entry, 1,100 ft. SE. of entrance. Coal is 3 ft. 11 in. thick. **651.** Face of room 35, 5 W. entry, 1,500 ft. SW. of slope mouth. Coal is 3 ft. 10⅜ in. thick.

652. Face of room, 7, 2 E. entry, 250 ft. from slope and 550 ft. from drift mouth. Coal is 2 ft. ¾ in. thick. **653.** Composite 648-652.

HYDROCARBON COMPLEXES (369-1178).
PENNSYLVANIA COALS. (436-874).
CHOCTAW OR SOUTHERN COAL FIELD. (487-874).

Upper Hartshorne Coal. (654-679). **654. Buck,** Pittsburg Co., 1 mi. E. of. Buck Mine No. 22, sec. 12, T. 5 N., R. 15 E. From 1 E. bottom entry, 6 ft. from face of slope, 300 ft. from surface. Coal is 2 ft. 10¼ in. thick. Ash softens at about 2,200°F. Sampled 9-22-'16.

655-657. Haileyville, Pittsburg Co., 1 mi. S. of. Hailey-Ola Mine No. 2 T. 5 N., R. 17 E. **655.** Face of 1 S entry, main slope entry. Coal is 3 ft. 1½ in. thick. Ash softens at 2,090-2130°F. Sampled 4-12-'18. **656.** Face of 1 N. entry, main slope. Coal is 3 ft. 4 in. thick. **657.** Composite of 655 and 656.

658-679. Wilburton, Latimer Co. **658-662. Great Western Coal & Coke Co. 658-660.** Mine No. 2, S. ½ sec. 10, T. 5 N., R. 19 E. Fancy lump. **659.** Coal cokes, ash is of pale buff color and does not clinker. **660.** Mine sample of 50 in. cut. **661-662.** Mine No. 3, SE. ¼ sec. 9, T. 5 N., R. 19 E. Mine samples. Coal cokes. Ash is pale buff in color and does not clinker. **663.** W. side of Wilburton, E. part of sec. 8, T. 5 N., R. 19 E. McAlester Coal & Mineral Co. Mine upper slope. This coal yields, lustrous, hard, and slightly swollen coke. **664-665. Degnan-McConnell Coal Co.,** Mine No. 5, SW. ¼ sec. 8, T. 5 N., R. 19 E. **666.** M. K. & T. Coal Co., Mine No. 19, SW. ¼ NW ¼, sec. 36, T. 6 N., R. 18 E. Mine sample. **667.** Eastern Coal and Mining Co., Mine No. 21, SE¼ SW¼ sec. 6, T.5 N., R. 19 E. 668-679. **Degnan-McConnell Coal Co., sec.** 8, T. 5 N., R 19 E. **668.** Mine No.6. 50 in. cut. Mine sample. **669-679.** ¼ mi. W. of Wilburton, New Mine No. 5. **669.** Room 17, 12 W. entry, 1,200 ft. W. of main shaft. Coal is 3 ft. 10½ in. thick. Ash softens at 2,020-2340° F. Sampled 1-27-'17.

Upper Hartshorne Coal (654-679). **670.** Face of room 2, A entry, 600 ft. NE. of main shaft. Coal is 3 ft. 8¼ in. **671.** Face of room 3, B entry, 200 ft, of main shaft. Coal is 3 ft. 10⅞ in. thick. **672.** Face of room 15, 10 E. entry, 1,100 ft. SE of main shaft. Coal is 3 ft. 10 in. thick. **673.** Composite of 669-672. **674.** Face of 6 E. entry. Coal is 4 ft. ¼ in. thick. Sampled 6-17-'18. **675.** Face of Main E. entry. Coal is 3 ft. 9¼ in. thick.

676. Face of 12 W. entry. Coal is 3 ft. 9½ in. thick. **677.** Face of 10 E. entry. Coal is 4 ft. 8¼ in. thick. **678.** Face of 10 W. entry. Coal is 3 ft. 11¼ in. thick. **679.** Composite tipple sample of coal as loaded. Sampled 6-8-'18.

McAlester Coal. (680-856).

680-705. Alderson, Pittsburg Co. **680-687. Alderson Coal Co.** Mine No. 5 **680-682.** Center of NE. ¼ sec. 22, T. 5 N., R. 15 E. **682.** Block on exhibit at Mineral Building of Oklahoma State Fair at Oklahoma City. **683-687.** 1½ mi. SW. of Alderson, Mine No. 5, sec. 15, T. 5 N., R. 15 E. **683.** Face of room 1, off W back entry 4, of W. slope, 2,200 ft. W. of shaft. Coal is 3 ft. 7 in thick Mine Sample. **684.** Face of room 7, off W. entry 7, off W. slope, 2,800 ft. NW. of shaft. Coal is 3 ft. 5 in. thick. **685.** Face of room 66, off E. entry 11, off E. slope, 4,000 ft. E. of shaft. Coal is 2 ft. 6 in. thick. **686.** W. entry 2, off E. slope, 2,000 ft. SE. of shaft. Coal is 3 7 in. thick. **687.** Composite of 683-686. **688-692.** 2 miles W. of Alderson. Alderson Mine No. 38, T. 5 N., R. 15 E. **688.** Room 1, off W. entry 7, 2,200 ft. down main slope. Coal is 2 ft. 9 in. thick. Sampled 1-x-'11. **689.** Room 4, off E. entry 5,230 ft. down main slope. Coal is 3 ft. 3 in. thick. Mine sample. **690.** Room 26 off E. entry 4, 1,900 ft. down main slope. Coal is 3 ft. 6 in. thick. Mine sample. **691.** Face of E. entry 6. Coal is 3 ft. 6 in. thick. Sampled 12-1-'12. **692.** W. air course 7. coal is 3 ft. 9 in. thick. **693-701.** Mine No. 5, ¼ mi. SW. of Alderson, sec. 22, T. 5 N., R. 15 E. **694.** Face of 5 E. entry, off main W. slops entry. Coal is 2 ft. 6 in. to 3 ft. 4 in. thick. Ash softens 2,030-2,90°F. Sampled 5-13-'18. **695.** Face of 5 W. entry, off main W. slope entry. Coal is 3 ft. 4⅝ in. thick. **696.** Face of 7 E. entry, off main W. slope entry. Coal is 3 ft 4½ in. thick. **697.** Face of 3 W. entry, off of main W. slope entry. Coal is 3 ft. 10 in. thick. **698.** Face of 9 W. entry, off main W. slope. Coal is 3 ft 4½ in thick. **699.** Face of 4 W. entry, off 1 slope, E. side. Coal is 3 ft 6½ in. thick. **700.** Face of 5 E. entry, off slope 1 E. side. Coal is 3 ft. 10½ in. thick. **701.** Composite of 694-700. **702-705.** Mine 38, ½ mi. E. of Alderson, secs. 19 and 24,T. 5 N., R. 15 and 16 E. **702.** Face of 9 W. entry, off main slope entry. Coal is 3 ft. 6 1-16 in. thick. Ash softens 1,950-2,160°F. Sampled 5-14-'18. **703.** Face of 6 E. entry, off main W. slope entry. Coal is 3 ft. 1⅛ in. thick. **704.** Face of main E. entry, off main slope entry. Coal is 2 ft 8 3-16 in. thick. **705.** Composite of 702-704.

706. Baker, Pittsburg Co., Great Western Coal & Coke Co. Mine No. 9, NW. ¼ sec. 4, T.5N., R. 14 E. Mine sample.

707-715. Busby, Pittsburg Co., 2 mi. E. of McAlester, **Osage**

Coal & Mining Co. Mine No. 5, SE. ¼ sec. 32, T. 6 N., R.15 E. **707-708.** Mine sample. **709.** Room 11, off W. entry 3, off E. slope, 1,600 ft. from shaft. Coal is 4 ft. 2 in. thick. Sampled 1-x-11. **710.** Face of W. entry 2, off W. slope, 300 ft. beyond room 26. Coal is 4 ft. thick. **711.** Face of E entry 3, off E. slope, 120 ft. beyond room 22. Coal is 4 ft. 2 in. thick. **712.** Face of E entry 4, off W. slope. Coal is 4 ft. thick. **713.** Face of E. entry 5, off E. slope. Coal is 4 ft. 3 in. thick. **714.** Face of E. entry 3, off W. Slope, 200 ft. beyond room 8. Coal is 4 ft. thick.

715. Composite of 707-714.

716-724. Carbon, Pittsburg Co. **716.** Central Coal & Coke Co. Mine, S. ½ sec. 6, and N. ½ sec. 7,T. 5 N., R. 16 E. Mine sample. **717.** 2½ mi. E. of Carbon, Boring No. 9, 1,050 ft. from center of tract 30, sec. 4, T. 6 N., R.16 E. Depth to coal is 561-2-3 ft. Coal is 38 in. thick. Sampled '08. **718-724.** 1 mi. E. of Carbon. Carbon Mine No. 2. **718.** Face of 5 W. entry,main slope entry. Coal is 3 ft. thick. Sampled 6-20-18. **719.** Face of 7 E. entry main slope entry. Coal is 3 ft. 1⅛ in. thick. **720.** Face of 6 W. entry, main slope entry. Coal is 2 ft. 8½ in. thick. **721.** Tipple sample of lump coal, over a 2½ in. screen. Sampled 6-20-'18. **722.** Tipple sample of nut coal, through a 2½ in. and over a 1¼ in. screen. **723.** Tipple sample of chestnut coal, through a 1¼ and over a ¾ in. screen. **724.** Tipple sample of slack coal through a ¾ in. screen.

725. Chambers, Pittsburg Co. Chambers Mine,, sec. 34, T. 5 N., R. 14 E. Mine sample. Sampled '05.

726-733. Coalgate, Coal Co. **726.** Southwestern Development Co. Mine sample of slack coal. **727-730.** Coalgate Co. Mine No. 5, NE¼ NE¼ sec. 22, T. 1 N., R. 10 E. **727.** Screened coal. Lehigh bed. **728.** Carload sample. **729.** Bony coal. **730.** Mine sample. **731-733.** M. K. & T. R. R. Co. Coal Dep't Mines **731.** Mine No. 10, SE ¼ sec. 13, T. 1 N., R. 10 E. Mine run. Lehigh bed. **732.** Mine No. 12, SW ¼ sec. 25, T. 1 N., R 10 E. Mine run. Lehigh bed. **733.** Mine No. 14, sec. 7, T. 1 N., R. 11 E. Lehigh bed.

734. Coleman, Pittsburg Co., sec. 9 T. 4 N., R. 16 E., Bolen-Darnell Mine. Coal is 3¼ ft. thick. Mine sample. Sampled '05.

735-739. Craig, Pittsburg Co. **735.** 3 m. E. of Craig, Boring No. 7, sec. 19, T. 4 N., R. 16 E. 441 ft. 6 in. deep. Coal is 4 ft. thick. Sampled '18. **736.** 3 mi. S. Craig, Boring No. 6, 1,150 ft. N., 60°E. of SW corner sec. 11, T. 3 N., R. 14 E. Tract 53. Top of coal is 410 ft. 3 in. below the surface. Coal is 3 ft. 11 in. thick. Sampled 3-30-'08. **737-739.** Bolen-Darnell Mine

No. 4. sec. 9, T. 4 N., R. 16 E. **737.** Face of 8 W. entry, 3,000 ft. NW of mine mouth. Coal is 2 ft. 10¼ in. thick Sampled 11-12-'12. **738.** Face of 8 E. entry, 3,000 ft. from mine mouth. Coal is 3 ft. ¼ in. thick. **739.** Nut coal.

740-745. Dow, Pittsburg Co., Milby & Dow Coal & Mining Co. **740.** Sec. 26, T. 5 N., R. 16 E. Coal is 35 in. thick. Sampled '05 **741.** Mines 2 and 5, N. ½ sec. 27, and NE. corner SW ¼ sec. 22, T. 5 N., R. 16 E. Lump coal. **742.** Mine No. 9, SE corner SW ¼ sec. 27, T. 5 N., R. 16 E. Mine sample.

Note: Edwards. (See Pittsburg).

746. Grady Basin, Grady coal. Average of 7 analyses.

747-748. Haileyville, Pittsburg Co., SW. of. Hailey-Ola Coal Co. Mine No. 6, NW¼ sec. 11, T. 4 N., R. 16 E. **747.** Lump coal. **748.** Mine sample.

749. Hughes, Latimer Co. Turkey Creek Mine, SE. ¼ sec. 33, T. 6N., R. 22 E. Coal is 2½ ft. thick. Sampled '05.

750. Johnston, Southern Coal Company.

751-767. Krebs, Pittsburg Co., **Osage Coal & Mining Co., Mines.**--**751.** Shaft No. 10, NW. ¼ sec. 10, T. 5 N., R. 15 E Carload samples. The coke from this coal is lustrous, with black patches and is moderately swollen. Ash is light brown. **752.** Mine sample. **753.** S. of Krebs, Mine No. 8, NW. ¼ sec. 15, T. 5 N., R. 15 E. Mine sample. **754.** N. of Krebs, old Homer slope, NW. ¼ sec. 33, T. 6 N., R. 15 E. Mine sample. **755-756** Mine No. 5 (same as Busby No. 5) SE¼. SE. ¼ sec. 32, T. 6 N., R. 15 E. **755.** Egg coal. **756.** Washed chestnut coal. **757.** Mine No. 7, SE ¼ sec. 36, T. 6 N., R. 15 E. Egg Coal. **759.** Mine No. 7, SE ¼ sec. 36, T. 6 N., R. 15 E. Egg Coal. 758. Mine No. 8, center sec. 15, T. 5 N., R. 15 E. Egg coal. 759. Mine No. 9, SE. ¼ NW. ¼ sec. 4, T. 5 N., R. 14 E. Washed nut coal. **760.** Mine No. 2, SE ¼ sec. 35, T. 6 N., R. 14 E. Refuse from washer. **761-767.** 1¼ mi. of Krebs, **Mine No. 5. 761.** Face of 8 W. entry, E. slope. Coal is 4 ft. 1½ in. thick. Sampled 6-21-'18. **762.** Face of 2 W. entry, slope. Coal is 4 ft. thick. **763.** Face of 6 E. entry, E. slope. Coal is 4 ft. 1½ in. thick. **764.** Tipple sample of lump coal, over a 2½ in. screen. Sampled 6-21-'18. **765.** Tipple cample of nut coal through a 2½ in. screen. **766.** Tipple sample of pea coal, through a ⅞ in. screen. **767.** Tipple sample of slack coal, through a ⅝ in. screen.

768-797. Lehigh, Coal Co. **Folsom-Morris Coal Mining Co. 768-777.** ½ mi. N. of Lehigh, Shaft No. 5, Mine No. 5. (Formerly Great WesternCoal & Mining Co. Mine No. 5), NW¼ NE¼ sec. 14, T. 1, S., R. 10 E. **768.** Commercial coal. **770.** Old Atoka Coal & Mining Co. Mine, (Now Folsom-Morris?) **771.** S. entry 8, slope 5. Coal is 4 ft. thick. **772.** N. entry 3, S. slope. Coal

is 58 in. thick. **773.** Lump over a 1 in. screen. **774.** Lump. **775.** Sampled for boiler tests. **776.** Sampled for producer gas test. Coal produces 56.4 cu. ft. of gas per pound and 50 gal of tar from a 6,300 lb. lot. **777.** Mine sample. **778.** Mine No. 6, W. ½ E. ½ sec. 2, T. 1, S., R. 10 E. Coal does not clinker and yields a buff colored ash. **779-782.** (Old Great Western Coal & Mining Co. Mine No. 7), NE. ¼ SE. ¼ sec. 35, T. 1 S., R. 10 E. **779.** Raw pea and slack coal. **780-781.** Washed pea and slack coal. Does not coke. **782.** Refuse from washing pea and slack coal. **783-785.** Mine No. 8 SE. ¼ sec. 14, and NE. ¼ sec. 24, T. 1 S., R. 10 E. Boone Twp. **783.** Mine run coal. **784.** Coal cokes does not clinker and yields a reddish ash. **785.** 1½ mi SE of Lehigh. Room 19, N. entry 3, 2,000 ft. NW of shaft. Coal is 48 in. thick. **786-791.** Mine No. 5, 3,00 ft. NE. of Lehigh, sec. 14, T. 1 S., R. 10 E. **786.** Face of 1 S. entry, 8½ slope, top entry. Coal is 3 ft. 10 3-16 in. thick. Ash softens 1,950-2,230°F. Sampled 5-16-'18. **787.** Face of 11 S. entry, 5½ slope, bottom entry. Coal is 4 ft. 7¼ in. thick. **788** Face of 4 S. entry, 5 slope bottom entry. Coal is 4 ft. 6¼ in. thick. **789.** Face of 14 N. entry, 5 slope, top entry. Coal is 3 ft. 9 1-16 in. thick. **790.** Face of 13 N. entry, 5 slope, top entry. Coal is 4 ft. 11-16 in. thick. **791.** Composite of 786-790. **792-797.** Mine No. 8, 1½ mi. E. of Lehigh, sec. 24, T. 1 S., R. 10 E. **792.** Face of 6 S. entry, main slope, bottom entry. Coal is 3 ft. 11 7-16 in. thick. Ash softens 1,970-2,240°F. Sampled 5-17-'18. **793.** Face of 6 S. entry, plane entry, top entry. Coal is 3 ft. 7⅞ in. thick. **794.** Face of 7 S. entry, plane entry, top entry. Coal is 3 ft. 11½ in. thick. **795.** Face of 5 N. entry, main slope entry, bottom entry. Coal is 3 ft. 8⅞ in. thick. **796.** Face of 6 N. entry, plane entry, top entry. Coal is 3 ft. 9¼ in. thick. **797.** Composite of 792-796.

798. McAllester, Pittsburg Co., Osage Mining Co. Coal cokes. Coke is free of S and P.

799-806. McAlester. 799. Washed nut coal. Sample of 25 car shipments. **800.** Washed nut coal Sample of 12 cars. **801.** Slack coal. **802.** Pea coal. **803.** Lump coal. **804.** Pittsburg. **805.** Savanna. **806.** McAlester coal, Mine of Blue Ridge Coal Co., W. of Ft. Smith, Ark.

807-810. McAlester, Pittsburg Co. **807-808.** Bolen-Darnell Coal Co., Mine No. 3, SW. ¼ NW ¼ sec. 31, T. 6 N., R. 15 E. **807.** Sampled '05. **808.** Mine sample. **809-810.** 1 mi. W. of McAlester, Samples Coal & Mining Co. Mine No. 1, Samples slope, NW ¼ SE ¼ sec. 36, T. 6 N., R. 14 E. **809.** Carload sample of commercial coal. Coal yields a lustrous, strongly coherent coke. Ash is light brown. **810.** Mine run.

811. McKinney district, Little Narrows, Grady coal. Average of 2 samples. **812-813. Midway,** Coal Co. Folsom-Morris Coal Mining Co., Mie No. 1, sec. 36, T. 1 S., R. 10 E. **812.** Lump coal. **813.** Mine run.

814. Mitchell Basin, about 10 mi. W. of Arkansas line.

815-817. North McAlester, Pittsburg Co. **815.** N. of North McAlester, Clay Duncan Mine, S. ½ sec. 30, T. 6 N., R. 15 E Mine run coal. **816.** W. of North McAlester, Samples Coal & Mining Co., Mine No. 2, SW ¼ SE ¼ sec. 35, T. 5 N., R. 14 E. Mine run coal. **817.** W. of North McAlester, W. N. Paschal Mine, SE. ¼ sec. 35, T. 6 N., R. 14 E. Mine run coal. **818-824. Phillips,** Coal Co., ½ mi. E. of. Folsom-Morris Coal Mining Co., Mine No. 6, sec. 2, T. 1 S., R. 10 E. **818.** 10 S. entry, Lehigh bed. Coal is 4 ft. 4 in. thick. Mine run coal. **819.** Face of 10 N. entry, 6½ slope, top entry. Coal is 4 ft. 5 3-16 in. thick. Ash softens 2,110-2,240°F. Sampled 5-22-'18. **820.** Face of 10 N. entry, main slope entry, bottom entry. Coal is 4 ft. 11½ in. thick. **821.** Face of 11 S. entry, main slope entry, top entry. Coal is 4 ft. 7 ⅝ in. thick. **822.** Face of 10 S. entry, 6½ slope, top entry. Coal is 4 ft. 4 in. thick. **823.** Face of 10 S. entry, main slope entry, top entry. Coal is 4 ft. 5 ⅜ in. thick. **824.** Composite of 819-823.

825-841.--Pittsburg (formerly Edwards), Pittsburg Co. **McAlester-Edwards Coal Co. 825-837.** Mine No. 1 (formerly D. Edwards & Son, Mine No. 1)' E½ sec. 24, T. 3 N., R. 13 E. and all of sec. 19, T. 3 N., R. 14 E. Opening in sec. 19. **825.** E. air course No. 2. Coal is 48 in. thick. Run of mine coal. **826.** W. air course No. 2. Coal is 46½ in. thick. Mine sample **827.** Mine run coal. Non-coaking. **828.** Unwashed mine run coal. non-coaking. **829.** Washed mine run coal. Non-coaking. **830.** Mine run coal. 50 pct. small nut; 50 pct. bright black (lump?). Coal clinkers. Complete boiler tests were run on this coal by U S. government. **831.--Pittsburg** (old Edwards). **832.** Left entry 5, off E. entry 1,300 ft. N., 14°E. of slope mouth. Coal is 43 in. thick. Sampled 3-4-'10. **833.** W. entry 3, Mine run. **834.** Selected Domestic Lump. **835.** Mine run coal. **836.** Selected lump. **837.** Ash is buff colored and does not clinker. **838 841.** Mine No. 2, NW. ¼ sec. 20, T. 3 N. R. 14 E. **838.** Fresh face E. entry 2. Coal is 4 ft. thick. **839.** Coal is "semi-coking." Ash is buff color and does not cliner. **840.** Selected Lump Coal **841.** Mixed and washed slack coal from Mines Nos. 1 and 2.

842. Sans Bois, Haskell Co., 3 mi. NW. of. Sequoyah Coal & mining Co. Mine center T. 8 N., R. 20 E.

843-845. Savanna, Pittsburg Co. **844.** Savanna Mine No. 1,

T. 4 N., R. 14 E. Mine sample. Sampled '05. **845.**--Slope No. 1.

846. South McAlester, Pittsburg Co. Great Western Mine. Mine sample. Sampled '05.

847. Starville, Haskell Co., 1½mi. NW. of. Sequoyah Coal & Mining Co. Mine, T. 9 N., R. 21 E. Stigler Coal.

848-852.--Stigler, Haskell Co. **848.** Sequoyah Coal & Mining Co. Mine, center T. 9 N., R. 20 E. **849.** Sec. 7, T. 10 N., R. 22 E. Smithing Coal. Strip pit coal. Coal yields a very swollen coke, which is bright and hard but somewhat weak. Ash is salmon colored and does not clinker readily. Coal is 2 1-3 ft. thick. **850.** 1 mi. NE. of Stigler, Turner Bros. Strip pit. Coal is 1 ft. 10 in. thick Smithing coal. Sampled 8-18-'13. **851.** 2 mi. from Stigler, H. A. Turner Strip Pit. Coal is 1 ft. 10 in. thick. Ash softens at 2,050°F. Sampled 10-17-'16. **852.** 3 mi. NW. of Stigler, sec. 5, T. 9 N., R. 21 E. Coal is 22 in. thick. Ash softens at 2,050°F. Smithing coal. Sampled 4-24-'18.

853. Superior, LeFlore Co. Peabody Coal Co. "semi-anthracite" coal.

854-855. Tamaha, Haskell Co. **854.** 3½ mi. from Tamaha, Floyd Nunnally Strip Pit. Coal is 1 ft. 11½ in. thick. Ash softens at 2,250°F. Sampled 10-17-'16. **855.** Old Slope Mine Stigler field, sec. 19, T. 11 N., R. 22 E., near mouth of slope. Coal is 2 ft. 5 in. thick. Ash softens at 1,920°F. Smithing coal. Sampled 6-5-'18.

856. Whitefield, Haskell Co., 1 mi. S. and 1 mi. W. of. J. P. Ligon Strip Pit, sec. 24, T. 9 N., R. 19 E. Coal is 1 ft. 8½ in. thick. Ash softens at 2,000°F. Sample from face. Sampled 10-17-'16.

Witteville (Mayberry) Coals. **(857-874).**

Upper Witteville. **(857-867). 857-858.** Featherston, Pittsburg Co., NW. of. Center of T. 7 N., R. 17 E. **857.** Opening No. 2, face of entry, 100 ft. from mouth. Mine sample. **858.** Opening No. 1. 100 ft. below surface. Mine sample.

859. Okmulgee, Okmulgee Co., 12 mi. S. of. Center of T. 12 N., R. 13 E. Sequoyah Coal & Mining Co. Mine.

860-863. Quinton, Pittsburg Co., Central Coal & Coke Co. Mine. **860.** Mine No. 1 N. of Quinton. NE. ¼ NW.¼ sec. 25, T 8N., R. 18 E. Mine run coal. **861-863.** Mine No. 6, NW.¼ SE¼ sec. 27, T. 8 N.,R. 18 E. **861.** Main coal bed. Bone excluded. **862.** Bony coal. **863.** Screened coal.

HYDROCARBON COMPLEXES. **(369-1178).**

CHOCTAW OR SOUTHERN COAL FIELD. **(487-874).**

Witteville (Mayberry) Coals. **(857-874).**

Upper Witteville. **(857-867). 864.** Reams, 4 mi. NE. of

865-867. Witteville, LeFlore Co. **865.** Witteville Mine, sec. 15, T. 7 N., R. 25 E. Mine run coal. Coal cokes to a lustruous, firm and greatly swollen mass. **866-867.** Mayberry Mine, sec. 11, T. 7 N., R. 24 E. Coal yields a lustruous, firm and greatly swollen coke. **866.** Standard sample. **867.** Selected sample.

Lower Witteville. **(868-874).**

868-874. Calhoun, LeFlore Co., Central Mine No. 8. **868.** Face of 7 E. entry, main slope entry. Coal is 3 ft. 8¼ in. thick. Sampled 6-14-'18. **869.** Face of 13 W. entry, main slope entry. Coal is 3 ft. 11¾ in. thick. **870.** Face of 12 W. entry, main slope entry. Coal is 3 ft. 11½ in. thick. **871.** Face of 11 W. entry, main slope entry. Coal is 3 ft. 7¾ in. thick. **872.** Face of 8 E. entry, main slope entry. Coal is 3 ft. 11 13-32 in. thick. **873.** Tipple sample of lump coal, over an 8 in. bar screen. **874.** Run of mine coal, through an 8 in. bar screen.

GASES. **(875-1002).**

875-877. Bartlesville, Washington Co. **877.** From city lines **878. Bigheart,** Osage Co. Dry gas from Empire gasoline plant.

879. Billings Field, Noble Co. From E. N. Gillespie Gas Well, sec. 21, T. 23 N., R. 2 W. Depth of sand 1,036 ft.

880-883. Blackwell, Kay Co., Oklahoma Natural Gas Co., Well No. 16. Shallow sand. **881.** Union Oil & Gas Co. Well No. 2. Gas pressure 185 lbs. **882.** Pipe line at plant of Oklahoma Natural Gas Co. **883.** Same as 882 but after gasoline has been extracted.

884. Cement Field. Sample from lines at Oklahoma City.

885.—Chelsea, Rogers Co.

886-890.—Comanche Gas Field, Stephens Co., T. 2 S., R. 7 W. **886.** Magnolia Petroleum Co., Grace E. Carter No. 1½, sec. 17. 948 ft. to sand. Initial production, 2½ million cu. ft. Rock pressure 320 lbs. Dry gas. **887-890.** Comanche Petroleum Co. **887.** Leolena Johnson No. 1, sec. 29. Sand 877-880 ft. depth. Initial production, 4 million cu. ft. Rock pressure 320 lbs. Dry gas. **888.** Clara Wilson No. 1, sec. 20. Sand 1,286-1,324 ft. Initial production, 20 million cu. ft. Rock pressure, 500 lbs. Wet gas. **889.** Jno. Wilson No. 1, sec. 19. Sand, 1,367-1,409 ft. Initial production, 16 million cu. ft. Rock pressure, 480 lbs. Dry gas. **890.** Jno Wilson No. 2, sec. 19. Sand 1,250-1,266 ft. Initial production, 12 million cu. ft. Rock pressure, 350 lbs. Wet gas.

891. Cotton Co., mouth of Cache Creek at Red River. Marsh (?) gas. H_2S present.

892. Covington, Garfield Co., Empire properties. Casinghead gas.

893-898. Cushing, Payne Co. **893.** Intake gas. Wet gas. Tower Gasoline Co. **894.** Same as 893 except discharge gas.

895-898. Composite gas sample of 30 wells in Bartlesville sand **895-896.** Intake or wet gas. **895.** Sampled 7-x-'19. **896.** Sampled 2-x-'20. **897-898.** Gas after removal of gasoline. **897.** Sampled 7-x-'19. **898.** Sampled 2-x-'20.

899-900. Deaner Field, Okfuskee Co., sec. 15, T. 11 N., R. 11 E. **899,** Central National Co. Well No. 7, extreme NW. of S. ½ SW. ¼ sec. 15. Deaner sand. Casinghead gas. **900.** Deaner and Jameson, Darr No. 8, NW. N. ½ SW. ¼ sec. 15. Kingman sand. Casinghead gas. 1 gal. gasoline per M cu. ft. of gas.

901. Dewey, Washington Co., Dewey Portland Cement Co. gasoline plant. Casinghead gas.

902. Dilworth Field. Wichita National Pipe Line sample.

903-904.—Duncan, Stephens Co. Gas Field. **903.** Western Oklahoma Gas & Fuel Co. Wells. Sampled 10-27-'13. **904.** NE. ¼ SE ¼ sec. 12, T. 1 N., R. 6 W.

905-906. Enoch Ketchem Lease, Wolverene Oil Co., sec. 2, T. 27 N., R. 13 E. **905.** Well No. 3. Casinghead gas. Sp.g., 1.04. Gasoline contents 1.65 gal. per M cu. ft. of gas. **906.** Well No. 4. Sp.g., 1.01. Gasoline content, 0.19 gal. per M cu. ft. of gas.

907-908. Glenn Pool at Keifer, Tulsa Co. Plant No. 4. **907.** Gas as drawn from well. Contains 1½ gal. of "wild" casinghead gasoline per M cu. ft. of gas. **908.** Gas of 907 after being stripped of its gasoline content.

909-910. Guthrie, Logan Co. **910.** Analyzed 7-8-'14.

911. Hominy, Osage Co., W. of. T. 23 N., R. 7 E. Well drilled by Gypsy Oil Co. Inert gases largely nitrogen but possibly some helium.

912. Kelleyville, Creek Co. Booster station of Oklahoma Natural Gas Co. Sampled 4-12-'21.

913-914. Loco, Stephens Co. Gas Field, sec. 15, T. 3 S., R. 5. W. **913.** Gas Well No. 7, NW corner sec. 15. **914.** NE. ¼ sec. 15.

915. Main farm, Payne Co. Magnolia Petroleum Co. No. 4, sec. 34, T. 19 N., R. 4 E. Sand at 1,783 ft. Open flow, 13,765,000 cu. ft. Sp.g., 0.87. Rock pressure, 500 lbs.

916 McMann Pipe Line of Oklahoma Natural Gas Co. Outgoing gas.

917. Morrison Field, Pawnee Co. G. L. Miller Well No. 1, in T. 23 N., R. 3 E.

918. Muskogee, Muskogee Co. Sampled 10-x-'14.

919-920. Meyers Field, Osage Co. 6 mi. SE. of Pearson Field, NE. corner T. 26 N., R. 8 E. **919.** Gas at 317 ft. **920.** Gas at 1,150 ft.

921. Nowata, Nowata Co. Sampled 9-x-'14.

922-928. Oklahoma City, Oklahoma Co., gas delivered to.

Oklahoma Natural Gas Co. **922.** Pipe line sample of stripped gas. **923.** Wet gas. **924.** Pipe line sample of wet gas. **925-928.** Gas delivered to Oklahoma City in '19.

929-930.--Okmulgee, Okmulgee Co. From Kingwood line. **929.** Intake gas.

930. Discharge gas.

931-933. Osage Co. **931.** Indian Territory Illuminating Oil Co., Gas Well No. 45, top of Mississippi lime, NW ¼ sec. 31, T. 27 N., R. 12 E. Sampled Nov. and Dec. '17. **932.** Composite sample of gases from Bartlesville sand, Skelton-Moore Oil Co. Wells, Nos. 9, 12, 15, 28 in sec. 34, T. 26 N., R. 12 E. **933.** Peru sand. Skelton-Moore Oil Co. Well No. 23, SW. ¼ sec. 34,T. 26 N., R. 12 E.

934-936. Pawhuska, Osage Co. **934.** Sampled 9-x-'14. **935.** Sampled 9-6-'14. **936.** Sampled 8-x-'14.

937. Pearson Field, Osage Co., secs. 10 and 20, T. 27 N., R. 8 E. Gas at 900 ft.

938. Personia Field, Osage Co. McMann Oil & Gas Co., Ethyl Bryant No. 2, sec. 18, T. 27 N., R. 8 E. Produces from the Mississippi lime at 2,450-2,465 ft. depth. Production, 5,000,000 cu. ft. per da.

939-940.--Pershing Field, Osage Co. **939.** Indian Territory Illuminating Oil Co. Well No. 187, Gas Well No. 4 SW ¼ sec. 31, T. 25 N., R. 10 E. in Oswego lime at 1,623-1,641 ft. depth. Produces 19,668 cu. ft. per da. **940.** Carter Oil Co. Well No. 11, Gas Well No. 3, SE. ¼ sec. 6, T. 24 N., R. 10 E. Bartlesville sand at 2,015-2,063 ft. Produces 3,250,000 cu. ft. of gas and 5 bbls. of oil per da.

941. Sapulpa, Creek Co.

942-943. Shamrock, Creek Co. **942.** Wet gas from Oklahoma Natural Gas Co. pipe line. **943.** Stripped gas.

944-945. Stroud, Lincoln Co. Oklahoma Natural Gas Co. pipe line. **944.** Wet gas. **945.** Stripped gas.

946-953.--Tonkawa Field, Noble Co., T. 24 N., R. 1 W. (No. 951 is in T. 25 N., R. 1 W., Kay Co.) **946. Blubaugh Lease, Well** No. 2, SW. ¼ SW. ¼ sec. 2. Depth of well 885 ft. Initial open flow, 7,000,000 cu. ft. Initial rock pressure, 270 lbs. per sq. in. Total depth of well, 885 ft. **947.** Gypsy Oil Co., Shober Lease, Well No. 2, NW. ¼ NW. ¼ sec. 2. Depth of well, 840 ft. Initial open flow, 17,310,720 cu. ft. Initial rock pressure, 260 lbs. per sq. in. Total depth of well, 845 ft. **948.** Southwestern Petroleum Co., Murray Lease, Well No. 5, SE ¼ SW. ¼ sec. 10. Depth of well, 885 ft. Initial open flow, 5,000,000 cu. ft. Initial rock pressure, 250 lbs. Total depth of well, 1,780 ft. **949.** Blackwell Oil & Gas Co., Ruzek Lease, Well No. 5, E. central part of

NW. ¼ sec. 3. Depth of well, 840 ft. Initial open flow, 8,000,000 cu. ft. Total depth of well, 904 ft. **950.** Southwestern Petroleum Co., Well No. 5, SE ¼ SW ¼ sec. 10. Depth of well, 925 ft. Initial open flow, 5,000,000 cu. ft. Initial rock pressure, 250 lbs per. sq. in. Total depth of well 1,780 ft. **951.** Penrock Oil Co., Endicott Lease, well No. 1, SW. ¼ SE. ¼ sec. 34. T. 25 N., R. 1 W. Depth of well, 1,636 ft. Initial open flow, 74,500,000 cu. ft. Initial rock pressure, 650 lbs. per sq. in. Total depth of well, 1,636 ft. **952.** White Eagle Oil & Refining Co. Novotny Lease, Well No. 2, SW. ¼ SE. ¼ sec. 10. Depth of well 1,974 ft. Initial open flow, 3,000,000 cu. ft. 953. Comar Oil Co., See Lease, Well No. 5 (?) NE. ¼ NW. ¼ sec. 15. Depth of well, 1,990 ft.

954.--Wynona Field, Osage Co. Phillips Petroleum Co., Well No. 14, NW ¼ sec. 25, T. 24 N., R. 9 E. Depth of sand, 2,073-2,110 ft. This is above the Bartlesville sand.

HELIUM BEARING GASES. **(955-1002).**

955. Ada. Pontotoc Co. Pipe line sample from field in T. 24 N., R. 6 E. Initial rock pressure, 440 lbs. Field yielded 100,000,000 cu. ft. on open flow. Average depth of wells 1,100 ft. Sampled 6-30-'18.

956. Bartlesville, Washington Co. Sampled 7-8-'06.

957-958. Billings, Noble Co. **957.** E. N.Gillespie Well No. 1, sec. 21, T. 23 N., R. 2 W. Rock pressure, 85 lbs. per sq. in. Initial open flow, 10,000,000 cu. ft. Depth of well, 1,052 ft. Sampled 8-28-'18. **958.** Iva B. Reed Well No. 1, sec. 29, T. 24 N., R. 1 W. Rock pressure, 60 lbs. Open flow, 250,000 cu. ft. Depth, 574 ft. Sampled 8-28-'18.

959-965. Blackwell Field, Kay Co. **959-963.** T. 29 N., R. 1 E. **959.** Union Gas & Oil Co. Well No. 2. Rock pressure, 185 lbs. per sq. in. Open flow 1,000,000 cu. ft. 640 ft. deep. Sampled 8-31-'18. **960.** Hennessy Well No. 1, sec. 30. Rock pressure, 125 lbs. per sq. in. Open flow, 280,000 cu. ft. 700 ft. deep. Sampled 8-30-'18. **961.** Ira Schutz, Well No. 2, sec. 31. Rock pressure, 550 lbs. per. sq. in. Open flow 7,250,000 cu. ft. 2,186 ft. deep. Sampled 8-30-'18. **962.** Ira Schutz Well No. 5, sec. 31. Rock pressure, 280 lbs. per sq. in. Open flow, 4,600,000 cu. ft. 1,370 ft. deep. Sampled 8-31-'18. **963.** Hobaugh Well No. 2, sec. 30. Rock pressure, 500 lbs. per sq. in. Open flow, 9,000,000 cu. ft. 1,868 ft. deep. Sampled 8-29-'18. **964-965.** T.28 N., R. 1 E. **964.** Dilworth Well No. 1, sec. 5. Rock pressure, 150 lbs. per sq. in. Open flow, 800,000 cu. ft. 930 ft. deep. Sampled 8-29-18. **965.** Kay & Kiowa Oil Co. Well sec. 13. Rock pressure, 170 lbs. per sq. in. Open flow, 1,000,000 cu. ft 787 ft. deep. Sampled 8-29-'18.

966. Bristow, Creek Co., Shields Well No. 1, sec. 30, T. 15 N., R. 9 E. Rock pressure 310 lbs. per sq. in. Open flow 744,000 cu. ft. Bruner sand at 965 ft. depth. Sampled 3-22-'10.

967. Cement Field, Caddo Co., Gregory Well No. 1, sec. 31, T. 6 N. R. 9 W. Open flow, 35,000,000 cu. ft. Depth, 2,340 ft. Sampled 9-x-'18.

968. Duncan Field, Stephens Co., Washita Gas & Fuel Co. Well, sec. 12, T. 1 N., R. 6 W. 850 ft. deep. Sampled '18.

969-970. Fox Field, Carter Co., T. 2 S., R. 3 W. **969.** Mattie Morris Well No. 2, sec. 28. Rock pressure, 540 lbs. per sq. in. Open flow, 40,000,000 cu. ft. 1,950 ft. deep Sampled 6-30-'18. **970.** Lucinda Well No. 1, sec. 29. Rock pressure, 280 lbs. per sq. in. Open flow 30,000,000 cu. ft. 1,450 ft. deep. Sampled 6-30-18.

971-972. Ingalls Field, Payne Co., Chevalier Well, sec. 27, T. 19 N., R. 4 E. **971.** Sampled 11-14-'17. **972.** Sampled 1-24-'18. When well was deeper than 1,800 ft.

973-974. Keyes Field, Cotton Co., T. 1 S., R. 10 W. **973.** J. C. Keyes Well No. 1, sec. 23. Rock pressure, 900 lbs. per sq. in. Open flow, 9,500,000 cu. ft. 2,178 ft. deep. Sampled '18. **974.** Pipe line sample.

975-977. Loco Field, Stephens Co. **975.** Allen & Gilbert Well No. 3, T. 3 S., R. 5 W. **976.** Allen & Gilbert Well No. 2. **977.** Mueller & Robinson Well No. 1.

978-981. Morrison Field, Pawnee Co. **978.** Fortuna Well No. 1, T. 23 N., R. 3 E. Sampled '18. **979.** G. L. Miller Well No. 1. Initial open flow, 40,000,000 cu. ft. 2,040 ft. deep. **980.** D. Miller Well. **981.** Saunders Well No. 17.

982-985. Meyers Field, Osage Co., sec. 12, T. 26 N., R. 8 E. **982.** Sampled '18. **983.** American Pipe Line Co. Well No. 18. Rock pressure, 50 lbs. per sq. in. Open flow, 1,000,000 cu. ft. 549 ft. deep. Sampled 7/18/'18. **984.** American Pipe Line Co. Well No. 7. Rock presure, 340 lbs. per sq in. Open flow, 1,250,000 cu. ft. open flow, 1,122 deep. Sampled 7-18-'18. **985.** Pipe line sample of 55 wells averaging 1,100 ft. deep.

986-987. Osage City Field, Osage Co. sec. 12, T. 21 N., R. 8 E. Broden & Moore Wells. Casinghead gas. **986.** Well No. 1. Depth 600 ft. Sampled 9/1/'18. **987.** Well No. 8.

988. Pawhuska Field, Osage Co. Indian Territory Illuminating Oil Co. Well No. 206, sec. 36, T. 26 N., R. 9 E. 1,988 ft. deep. Sampled 7/18/'18.

989-1000. Pearson Field, Osage Co. secs. 10 and 20, T. 27 N., R. 8 E. American Pipe Line Co. Wells and pipe lines. Sampled '18. **989.** Well No. 4. **990.** Well No. 2. **991.** Well No. 3. **992.** Well No. 1. **993.** Well No. 2. **994.** 1,200 ft. deep.

995. Composite sample of all wells. **996.** Composite pipe line sample of all wells. **997.**--Well No. 29, sec. 20. Rock pressure, 100 lbs. per sq. in. Open flow, 1,000,000 cu. ft. 918 ft. deep. Sampled 7/18/'18. **998.** Well No. 28, sec. 19. Rock pressure, 98 lbs. per sq. in. Open flow, 1,020,000 cu. ft. 790 ft. deep. Sampled 7/18/'18. **999.** Well No. 53, sec. 22. Rock pressure, 500 lbs. per sq. in. Open flow 2,000,000 cu. ft. 1,442 ft. deep. Sampled 7/18/'18. **1000.** Composite sample of all wells. Sampled 7/18/'18.

1001-1002.--Ponca City Field, Kay Co. T. 25 N., R. 2 E. **1001.** J. D. Buntt Well No. 1, sec. 18. Rock pressure, 14 lbs. Open flow, 450,000 cu. ft. 610 ft. deep. Sampled 9/2/'18. **1002.** Margaret Primaux Well No. 7. sec. 4. Rock pressure, 21 lbs. per sq. in. Open flow, 500,000 cu. ft. 440 ft deep. Sampled 9/2/'18.

HYDROCARBON COMPLEXES. (369-1178).

OILS. (1003-1178).

1003 Avant, Osage Co. Composite of 11 samples.

1004-1005. Alluwe Pool, Rogers Co. Horace M. Adams Wells, sec. 16, T. 24 N., R. 17 E. 400 ft. deep. Sampled 4/14/'08. **1004.** Color of oil, dark green. It begins to boil at 67°C. **1005.** Color of oil, greenish-black. Begins to boil at 65°C.

1006. Aylesworth, Bryan Co. On state prison farm, sec. 25, T. 6 S., R. 6 E. in Trinity sand at 131 ft. depth. Yields 5 bbls. per da. Oil is of dark brown color, has a parrafin-asphalt base. Its flash point is about 195°C. Its over point is 282°C. It contains water in emulsion.

1007-1009. Bald Hill, Okmulgee Co. **1007.** Composite of 8 samples **1008-1009.** J. W. Buchanan Lease. Oil is dark green. **1008.** Burns & Caton Morris Well No. 1. Depth, 1,680 ft. Oil begins to boil at 110°C. Unsaturated hydrocarbons, 20.0 pct. of crude. Sampled 4/2/'08. **1009.** J. Harmon Morris Well No. 1 Depth, 1,703 ft. Oil begins to boil at 131°C. Unsaturated hydrocarbons, 16.4 pct. of crude.

1010-1017. Bartlesville Pool, Osage Co. **1010-1011.** Osage & Oklahoma Oil Co. Wells. 1010. Well No. 54. Depth, 722 ft. Yields 10 bbls. per da. Oil is dark brown with slight odor. **1011.** Well No. 7. Depth 1,382 ft. **1012.** Composite of 8 samples. **1013.** Prairie Oil & Gas Co. pipe line at Bartlesville. Oil is dark green. It begins to boil at 130°C. Unsaturated hydrocarbons, 25.2 pct. of crude. Sampled 4/11/'08. **1014-1015.** Colliver Consolidated Oil Co., Lease 31, Markham & Ball, Bartlesville. Oil is black. **1014.--Well No. 5** Depth, 1,487 ft. Oil begins to boil at 115°C. Unsaturated hydrocarbons, 20.4 pct. of crude. Sampled 4/11/'08. **1015.--Well No. 6** Depth, 1,480 ft. Oil begins to boil at 105°C. Unsaturated hydrocarbons, 30.8 pct. of crude.

1016. Illuminating Oil Co. Well No. 20, lot 32. Depth, 1,500 ft. Oil is dark green, begins to boil at 113°C, and contains 2X1.0 pct. of unsaturated hydrocarbons. Sampled 4/11/'08. **1017.** Prairie Oil & Gas Co. pipe line. Oil is dark green, begins to boil at 103°C. and contains 24.4 pct. unsaturated hydrocarbons.

1018-1019. Bigheart Field, Osage Co. **1018.** First drop at 36°C.

1020-1022. Bird Creek Pool, Creek Co. Oil is dark green. **1020.** Prairie Oil & Gas Co. pipe line sample. Oil begins to boil at 120°C., contains 29.2 pct. unsaturated hydrocarbons. **1021-1022.** Creek & Indiana Investment Co., Chisholm Lease. **1021.** N. Chisholm Lease, Well No. 1. Depth, 1,420 ft. Oil begins to boil at 100°C. and contains 29.2 pct. unsaturated hydrocarbons. Sampled 4/1/'08. **1022.** Well No. 4, Depth, 1,200 ft. Oil begins to boil at 122°C. and contains 14.0 pct. unsaturated hydrocarbons.

1023. Burbank Field, Osage Co., SW ¼ sec. 5, T. 26 N., R. 11 E. First drop comes over at 35°C.

1024-1026. Cement Field, Caddo Co. Oil is black by reflected light. **1024.** Fortune Oil Co. Niles Well No. 1 near center sec. 36, T. 6 N., R. 10 W. about 3½ mi. W and 1 mi N. of Cement. Depth, 2,362 ft. in Fortune sand. Yield, 100 bbls. per da. **1025.** Caddo Petroleum Co., Roe Well No. 2, near center sec. 36, T.6 N., R. 10 W. about 3¼ mi. W. and 1 mi. N. of Cement. Depth 1,821 ft. Caddo sand. Yield 225 bbls. per. da. **1026.** Gladstone Oil Co. Paukune Well No. 1, SE corner SW ¼ sec. 3, T. 5 N.,R. 9 W. about ½ mi. SE. of Cement. Depth, 2,400 ft. In Prosperity sand. Yield 130 bbls. da.

1027. Checotah.

1028-1029. Chelsea Pool, Rogers Co. T. 24 N., R. 16 E. **1028.** Steuben Lease Well No. 38, sec. 16, H. M. Adams, Chelsea. Depth, 500 ft. Oil is greenish-black, begins to boil at 80°C. and contains 26.u pct. unsaturated hydrocarbons. Sampled 4/14/'08. **1029.** Bennett Lease Well No. 1, sec. 14. H. M. Adams, Chelsea. Depth, 498 ft. Oil is dark brown, begins to boil at 97°C, and contains 26.4 pct. unsaturated hydrocarbons. Sampled 4/14/'08.

Childers Pool, Nowata Co. Oil is dark green. **1030.** New York & Pennsylvania Oil Co., Nowata. Susan Conner Lease Well No. 1, sec 35, T. 27 N., R. 16 E. Depth 735 ft. Oil begins to boil at 80°C, contains 38.4 pct. unsaturated hydrocarbons. Sampled 4/14/'08. **1031.** F. D. Bailey, Nowata. Jane Claggett Lease Well No. 3, sec. 8, T. 26 N., R. 16 E. Depth, 750 ft. Oil begins to boil at 78°C., contains 22.0 pct. unsaturated hydrocarbons. Sampled 4/15/'08.

1032-1052. Cleveland Pool, Pawnee Co. **1032.** 2 mi. S. of Cleve-

land on Frazie farm. **1033-1034.** Herbert Addition in city of Cleveland. **1034.** Carter Bros. Well. Oil had stood in tanks 4 wks. before sampled.

135. **Cleveland. 1036.** Prairie Oil & Gas Co., tan in Cleveland. Oil is black, boils at 97°C., contains 34.8 pct unsaturated hydrocarbons. **1037-1039.** Laterette Lease, Test Oil Co. Wells. **1037.** Well No. 16, city of Cleveland. Oil is dark green, begins to boil at 100°C., and contains 38.4 pct. unsaturated hydrocarbons. Sampled 4/11/'08. **1038.** Well No. 17. Oil begins to boil at 115°C., and contains 35.2 pct. unsaturated hydrocarbons. **1039.** Well No. 15. Oil begins to boil at 103°C. and contains 39.2 pct. unsaturated hydrocarbons. **1040.** Ohio & Indiana Oil Co. Well No. 8 and 9. Oil begins to boil at 117°C. and contains 34.8 pct. unsaturated hydrocarbons. **1041.** F. M. Martin, Cleveland, Cory Lease, Well No. 1, Jordan Valley Twp. Depth, 1,157 ft. Oil is dark green, begins to boil at 110°C., and contains 32.4 pct. unsaturated hydrocarbons. Sampled 4/10/'08. **1042.** J. E. Martin Cleveland. L. L. Cory Lease, Well No. 1, Jordan Valley Twp. Depth, 1,174 ft. Oil is dark green, begins to boil at 108°C., and contains 33.2 pct unsaturated hydrocarbons. Sampled 4/10/'08. **1043-1044.** Prairie Oil & Gas Co., Independence, Kan., Berger Lease. **1043.** Well No. 7. Depth 1,800 ft. Oil begins to boil at 80°C., and contains 38.8 pct. unsaturated hydrocorbons. Sampled 4/10/'08. **1044.** Well No. 4 Depth 1,750 ft. Oil begins to boil at 120°C. and contains 20.4 pct. unsaturated hydrocarbons. **1045-1046.** Louisiana Purchase Oil Co., Cleveland. Jordan Valley Twp. 1045. Lowery Lease Well No. 2 Depth 1,620 ft. Oil is dark green, begins to boil at 85°C., and contains 26.4 pct. unsaturated hydrocarbons. Sampled 4/10/'08. **1046.** Well No. 6. Depth 1,600 ft. Oil is dark green, begins to boil at 140°C., and contains 25.2 pct. unsaturated hydrocarbons. **1047-1052.** Minnetonka Oil Co., Cleveland. T. 21 N., R. 8 E. **1047.** Jones No. 2, center E. side of W. ½ sec. 20. Depth, 1,352 ft. Taylor sand. Oil begins to boil at 105°C.

OILS. (**1003-1178**).

1048. Alderson No. 6, center SW. ¼ sec. 17. Depth, 1,706 ft. Oil begins to boil at 70°C. **1049.** Haviland No. 7, SW SE. ¼ sec. 18. Depth, 1,799 ft. Oswego sand. Oil begins to boil at 78°C. **1050.** Jones 26, NW. ¼ sec. 20. Depth 2,047 ft. Skinner sand. Oil begins to boil at 80°C. **1051.** Lucas No. 1, NW. NE. ¼ sec. 21. Depth, 2,075 ft. Peru sand. Oil begins to boil at 78°C. **1052.** Jones No. 10, SW. ¼ NW. ¼ sec. 20. Depth 2,235. Bartlesville sand. Oil begins to boil at 105°C.

1053. Collinsville, Claremore Field, Rogers Co. Average of 2 samples.

1054-1060. Comanche Field, Stephens Co. **1054.** T. A. Eadmonds-Foster Wilson Well No. 1, 2,300 ft. S. and 2,440 ft. E. of NW. corner sec. 12, T. 2 S., R. 8 W. Depth 600 ft. Yield 8-9 bbls. per da. **1055-1060.** T. 2 S., R. 7 W. **1055-1056.** Magnolia Petroleum Co., Carter Co. Lease, 1,280 ft. N. and 200 ft. E. of SW. corner sec. 17. **1055.** Well No. 1 Depth 1,395 ft. Yield 160 bbls. per da. **1056.** Well No. 3. Depth 1,388 ft. Yield 40 bbls. per da. **1057-1060.** Comanche Petroleum Co. Wells. **1057.** Clara Wilson No. 1, 600 ft. S. and 150 ft. E. of NW corner sec. 20. Depth 1,327 ft. Yield, 20 bbls. per da. **1058.** Jno. Wilson No. 2. 200 ft. S. and 1,520 ft. W. of NE. corner sec. 19. Depth, 1,378 ft. Yield 8 bbls. per da. **1059** Alice Isaac No. 1. 600 ft. S. and 1,950 ft. E. of NW. corner sec. 19. Depth 1,419 ft. Yield, 15 bbls. per. da. **1060.** Susan Perry No. 1. 1,960 ft. N. and 1,960 ft. W. of SE. corner sec. 20. Depth 1,569 ft. Yield 2 bbls. per da.

1061-1063. Cushing Field, Payne Co. **1061.** Average of 7 samples. **1062.** Boston Pool. Average of 5 samples. Sampled 5/30/'14. **1063.** Bartlesville sand. Average of 6 samples. Sampled 5/28/'14.

1064-1067. Deaner Field, Okfuskee Co., T. 11 N., R. 11 E. **1064.** Kingwood Oil Co., Hilderbrandt No. 1, sec. 16. Kingwood sand. **1065.** Best Production & Refining Co. Well No. 1, Douglas farm, NE. corner SE. ¼ sec. 21. Kingwood sand. **1066.** Okliana, Jefferson No. 1, NE corner SW. ¼ sec. 16. Kingwood sand.

1067. Central National, Carter No. 2, SW. corner SW. ¼ sec. 15. Deaner sand.

1068-1069. Delaware Pool, Nowata Co. T. 27 N., R. 16 E. **1068.** Davis & Berrian, Wolf Lease, Well No. 1, sec. 31. Depth, 812 ft. Oil is light green, begins to boil at 65°C., and contains 18.4 pct unsaturated hydrocarbons. Sampled 4/15/'08. **1069.** Van Vleek & Graham Oil Co. Edgar Bean Lease, Well No. 4. sec. 33. Depth 830 ft. Oil is dark green, begins to boil at 81°C. and contains 12.8 pct. unsaturated hydrocarbons. Sampled 4/15/'08.

1070. Delaware and Chidres Pool, Nowata Co., Prairie Oil & Gas Co. Station 40. Pipe line tanks at Nowata. Oil is dark brown, begins to boil at 107°C., and contains 24 pct. unsaturated hydrocarbons.

1071-1073. Dewey Field, Washington Co. **1071.** Stubbs & Low. Dewey. Williams Lease, Well No. 4, T. 27 N. Depth 1,200 ft. Oil is dark green, begins to boil at 103°C., and contains 18.8 pct. unsaturated hydrocarbons. Sampled 4/12/'08. **1072.** Woodward & Roll, Dewey. Berger Lease, Well No. 1. Depth, 525 ft. Oil is black, begins to boil at 128°C. and contains 38 pct. unsat-

urated hydrocarbons. Sampled 4/13/'08. **1073.** Stubbs & Lowe, Dewey. McEwan Lease, Well No. 5. Depth, 500 ft. Oil is black, begins to boil at 80°C., and contains 34.8 unsaturated hydrocarbons.

1074. Duncan, Stephens Co., 20 mi. E. of. Oil is dark reddish brown, is asphaltic, and contains water.

1075. Flat Rock Pool, Tulsa Co. Average of 2 samples.

1076-1083. Glenn Pool, Creek Co. Oil is black. Sampled 3/28/'08. **1076.** Average of three samples. **1077.** Oklahoma State Oil Co., Kiefer. Grace Berryhill Leases, Wells Nos. 9 and 13. Depth, 1,500 ft Oil begins to boil at 112°C., contains 21.2 pct. unsaturated. **1078.** Argue & Compton, Tulsa, Pitman farm, Well No. 11, sec. [illegible] N., R. 12 E. Depth 1,500 ft. Oil begins to boil at 105°C. Contains 22.8 pct. unsaturates. **1079.** Prarie Oil & Gas Co., Kiefer. Pipe line sample at pump station. Oil begins to boil at 100°C., contains 27.6 pct unsaturates. **1080-1081.** Indiana Gas & Oil Co. **1080.** Thos. Berryhill Lease, Well No. 7. Depth, 1,518 ft. Oil begins to boil at 105°C. and contains 20.8 pct. unsaturates. **1081.** Wm. Berryhill Lease, Well No. 15. Depth, 1,529 ft. Oil begins to boil at 80°C. and contains 21.6 pct. unsaturate. **1082-1083.** Prarie Oil & Gas Co., Tulsa. M. B. Self Lease. **1082.** Well No. 23. Depth, 1,523 ft. Oil begins to boil at 94°C. and contains 16.8 pct. unsaturates. **1083.** Well No. 7 Depth, 1,553 ft. Oil begins to boil at 98°C and contains 26.4 pct. saturates.

1084-1087. Gotebo Pool, Kiowa Co. **1085.** Whitewater Oil & Gas Co., Gotebo. Ricketts Lease, Well No. 2. Depth, 365 ft. Oil is black, begins to boil at 115°C. and contains 29.6 pct. unsatrates.

1088. Granite Pool.

1089. Hamilton Switch, Okmulgee Co. Average of 5 samples.

1090-1099. Healdton Field, Carter Co. **1090.**--Coline Oil Co. Ardmore. Silsanny Jones Allotment, Dep't Lease, Well No. 1, sec. 4, T. 4 S., R. 3 W. Sampled, 5/23/,14. **1091.** Crystal Oil Co. Ardmore. Millian & Thomas farm, Well No. 3, extreme SE. corner of S. ½ SE. ¼ sec. 5, T. 4 S., R. 3 W. Sampled 5/23/'14. **1092-1093.** Sampled 4/12/'14. **1094-1095.**-- Sampled 5/1/'14. **1096-1097.** Sampled 3/23/'14. **1098.** Sampled 4/18/'14. **1099.** Average of 20 samples.

1100. Henryetta Pool, Okmulgee Co.

-- **1101. Homer** Pool, Carter Co., sec. 9, T. 1 S., R. 2 W. Production at 120 ft. Oil is greenish black by reflected light; brown by transmitted light. Odor is asphaltic. Overpoint, 255°C. Cracks badly.

1102. Hominy Creek, Osage Co.

1103-1105. Madill Pool, Marshall Co. **1105.** Malmillan Oil Co., Jeff Arbuckle farm, SW. ¼ sec. 25, T. 5 S., R. 5 E. Oil is dark olive by reflected light and dark wine colored by transmitted light. It begins to boil at 65°C. and contains 8 pct. unsaturates.

1106. Maude Pool, Seminole Co.

1107-1110. Morris Pool, Okmulgee Co. Sampled 4/2/'08. **1107.** Average of 4 samples. **1108.** Prairie Oil & Gas Co. settling tank at Morris. Oil is light green, begins to boil at 112°C. and contains 10.0 pct. unsaturates. **1109-1110.** Brown Oil & Gas Co., Morris. Meridian Lease. **1109.** Well No. 1. Depth, 1,600 ft. Oil is dark green, begins to boil at 82°C. and contains 13.6 pct. unsaturates. **1110.** Well No. 4. Depth, 1,600 ft. Oil is green, begins to boil at 75°C. and contains 13.2 pct. unsaturates.

1111-1112. Mounds Pool, Creek Co. **1111.** Swasey Oil Co., Ft. Worth, Tex., Corndoffer Lease, Well No. 1, sec. 18, T. 16 N., R. 12 E. Depth, 2,340 ft. Oil is bright green, begins to boil at 175°C., and contains 12.4 pct. unsaturates. Sampled 3/28/'08. **1112.** Average of 2 samples.

1113-1124. Muskogee Pool, Muskogee Co. Sampled 4/3 and 4/'08. **1113-1120. New Field.** Oil is olive green. **1113.** Average of 6 samples. **1114-1115.** Julia Oil Co., Muskogee. Evans Lease. **1114.** Well No. 1, Depth, 1,553 ft. Oil begins to boil at 97°C. and contains 15.2 pct. unsaturates. **115.** Well No. 3. Depth 1,473 ft. Oil begins to boil at 83°C., and contains 16.8 pct. unsaturates. **1116-1117.** Success Oil & Gas Co., Muskogee. **1116.** Stevens Lease Well No. 2. Depth, 1,558 ft. Oil begins to boil at 93°C., and contains 15.2 pct unsaturates. **1117.** J. W. Siebold Lease Well No. 1. Depth, 1,574 ft. Oil begins to boil at 90°C., and contains 16.8 pct. unsaturates. **1118.** Richmond Development Co., Muskogee. Ft. Worth Development Co. Lease, Well No. 1. Depth, 1,702 ft. Oil begins at 90°C., and contains 16.4 pct. unsaturates. **1119.** Huckleberry & Co. Muskogee. G. W. Sadler Lease Well No. 3. Depth, 1,735 ft. Oil begins to boil at 98°C., and contains 16.0 pct. unsaturates. **1120.** Prarie Oil & Gas Co., Muskogee. Pipe line tank. Oil begins to boil at 99°C., and contains 17.6 pct. unsaturates. **1121-1124.** Old Field. Oil is light olive green. **1121.** Pioneer Oil & Gas Co. Wells Nos. 1, 2, and 3. Depth, 1,000 ft. Oil begins to boil at 110°C., and contains 12.0 pct. unsaturates. **1122-1123.** P. Connolly, Muskogee. **1122.** Connolly Well. Depth, 1,000 ft. Oil begins to boil at 115°C., and contains 11.2 pct. unsaturates. **1123.** Reeves Well. Depth, 1,000 ft. Oil begins to boil at 140°C., and contains 12.4 pct unsaturates.

1125. Nelagony Pool, Osage Co.

1126-1127. Newkirk Pool, Kay Co. **1126.** Depth, 1,115 ft. **1127.** Newkirk Gas & Mineral Co., Well No. 1.

1128. Nowata Pool, Nowata Co. Average of 4 samples.

1129. Okeene, Blaine Co. 4 mi. S. and ½ mi. E. of NW. corner NE. ¼ sec. 7. T. 18 N., R. 10 W. Depth, 1,231 ft. Odor masked. Overpoint, 85°C.

1130. Okmulge Pool, Okmulgee Co. Average of 4 samples.

1131. Oresa Pool.

1132. Osage City. Average of 4 samples.

8—Fisher—2nd Geology.

1133-1136. Osage Co. **1133.** NE¼ sec. 35, T. 29. N., R. 11 E. First drop at 32°C. Carbon residue, 9.3 pct. **1134.—Skelton-**Moore Oil Co. Well No. 23, SW¼ sec. 34, T. 26 N., R., 12 E. Peru sand. **1135.** Wiser Oil Co. sec. 21, T. 27 N., R. 12. E. Shallow sand. **1136.** Indian Territory Illuminating Oil Co. Well

1137. Pawhuska, Osage Co.

1138. Ponca City, Kay Co. Oil is a deep olive green. Paraffin base.

OILS. **1003-1178.**

1139-1144. Red Fork Pool, Tulsa Co. Sampled 3/28/'08. **1139.** Average of 3 samples. **1140-1142.** Rob't Galbreath, Tulsa **1140-1141.** J. I. Yorgee Lease. **1140.** Well No. 3. Depth, 638 ft. Oil is green, begins to boil at 88°C., and contains 22.4 pct. unsaturates. **1141.—**Well No. 5. Depth, 601 feet. Oil is dark green, begins to boil at 93°C., and contains 17.6 pct. unsaturates. **1142.** Van Yorgee Lease, Wells 1-7. Depth, 1,240 ft. Oil from leader pipe is dark green, begins to boil at 90°C., and contains 22.4 pct. unsaturates. **1143.** L. E. Mallory & Son, Tulsa. Missouri Lincoln Trust Co. Lease, Well No. 1. Depth, 1,200 ft. Oil begins to boil at 97°C., and contains 14.4 pct. unsaturates. **1144.** Prarie Oil & Gas Co., pump station at Red Fork. Oil is black begins to boil at 110°C., and contains 18.4 pct. unsaturates.

1145-1154. **Robberson** Pool, Garvin Co., T. 1 N.,R. 3 W. Oil is dark brown by transmitted light; black by reflected light. It has a gasoline odor. **1145.** J. S. Bryan Well No. 2, SW. SE. SW. NW¼ sec. 14. Overpoint 52°C. **1146.** Concord Oil Co., Harkreader farm, Well No. 5, S. ½ SE. ¼ sec. 11. Overpoint 78°C. **1147.** Texas Co. Hector Herdyn farm, Well No. 1., NE. NE. NE. ¼ sec. 17. Overpoint 60°C. **1148.** Magnolia Petroleum Co. Mauldin Lease, Well No. 9, NW. ¼ sec. 15. Overpoint 55°C. **1149.** T. P. G. and O. Co., Mayes farm, Well No. 2, NE. NE. SW ¼ sec. 14. Overpoint 55°C. **1150.** Home-Okla Oil Co., Hervey farm, Well No. 1, sec. 14. Overpoint, 110°C. **1151.** Concord Oil Co., Harkreader farm, Well No. 1, sec. 11. Overpoint 87.5°C.

1152. Magnolia Petroleum Co., Hartringer farm, Well No. 3, sec. 11. Overpoint 73°C. **1153.** Wrightsmann, Pernell farm, Well No. 2, sec. 16. Overpoint 92°C. **1154.** Magnolia Petroleum Co., Orr. farm, Well No. 2. NE ¼ sec. 16. Overpoint 87°C.

1155. Salt Creek Pool, Okmulgee Co. Average of 5 samples.

1156. Sapulpa Pool, Creek Co. Average of 4 samples.
OILS. **(1003-1178).**

1157. Schulter Pool, Okmulgee Co. Average of 4 samples.

1158-1159. Shallow Sand Pool, Osage Co. T. 26 N. **1158.** Skelton-Moore Oil Co. Well No. 14. Depth, 1,088 ft. Oil is black, begins to boil at 76°C., and contains 21.2 pct. unsaturates. Sampled 4-8-'08. **1159.** Prairie Oil and Gas Co. Pipe Line Station No. 38, at Nowata. Oil is black, begins to boil at 100°C., and contains 24.4 pct. unsaturates. Sampled 4-15-'08.

1160-1162. Skiatook Pool, Creek Co. Shawnee Oil Co., Sperry. Oil is dark green. Sampled 4-1-'08. **1160-1161.** Smith Lease. **1160.** Well No. . Depth, 1,408 ft. Oil begins to boil at 95°C., and contains 14.8 pct. unsaturates. **1161.** Well No. 4. Depth, 1,412 ft. Oil begins to boil at 98°C., and contains 12.8 pct. unsaturates. **1162.** Chisholm Lease, Well No. 2. Depth, 1,466 ft. Oil begins to boil at 60°C., and contains 13.2 pct. unsaturates.

1163-1165. Slick Oil Field, Creek Co., T. 15, and 16 N., R. 10 E. **1163.** Glenn sand. **1164.** Dutcher sand. **1165.** Wilcox sand.

1166-1169. Tonkawa Field, Noble Co., T. 24 N., R. 1 W. Oil is light greenish. **1166.** Blubaugh Lease, Well No. 1, NW. corner SW. ¼ sec. 2. Upper Hoover sand. **1167-1169.** Comar Oil Co. **1167-1168.** Carmichael Lease. **1167.** Well No. 1, SW. corner NE. ¼ sec. 3. Lower Hoover sand. Depth, 2,118-2,122 ft. **1168.** Well No. 1A, SW. corner NE. ¼ sec. 3. Carmichael sand. Depth, 2,180-2,189 ft. **1169.** See Lease, Well No. 3, N. part NW. ¼ sec. 15. Tonkawa sand. Depth, 2,614-2,628 ft.

1170. Tulsa Pool, Tulsa Co.

1171. Turley Pool, Tulsa Co. Average of 5 analyses.

1172. Tuttle, Grady Co. In ice plant well on Frisco right-of-way. Oil is light yellow. Sp. g., O. 7775 at 25°/15°C. Overpoint, 109°C. Dry point, 310°C. There is a doubt as to whether this is crude or not.

1173. Weatherford, Custer Co., 3 mi. NW. of. Galloway or Magnolia test. SE. corner of NE. ¼ SW. ¼ sec. 21, T. 13 N., R. 14 E. Oil is black by reflected light and dark brown by transmitted light. It has a kerosene odor. Overpoint, 79.5°C.

1174-1176. Webber Pool, Washington Co. Oil is dark

green. Sampled 4-13-'08. **1174.** Bartles Oil Co., Dewey. Shaler Lease, Well No. 7. Depth, 1,250 ft. Oil begins to boil at 70°C., and contains 20.8 pct. unsaturates. **1175.** Stubbs and Lowe Well No. 2. Depth, 1,200 ft. Oil begins to boil at 98°C., and contains 20.5 pct. unsaturates. **1176.** Adams Oil and Gas Co., Washington, D. C., R. C. A. Well No. 1. Depth, 1,300 ft. Oil begins to boil at 95°C., and contains 30.8 pct. unsaturates.

1177. Wewoka Pool, Seminole Co. Wewoka Realty and Trust Co., Wewoka Well No. 1. Depth, 1,625 ft. Oil is black, begins to boil at 128°C., and contains 30.0 pct. unsaturates. Sampled 4-6-'08.

1178. Wheeler, Carter Co. Average of 2 samples.

WATERS. (1179-1463)

ARTESIAN WATERS. (1179-1193).

1179. Craig Co., Vinita. Frisco R. R. Well. Depth, 665 ft. Water sand in Cherokee shale. SiO_2, 10.2 p. p. m.; R_2O_3,1. 2 p. p. m.

1180. Creek Co. 2½ mi. NW. of Sapulpa. Goodwell Oil Association Well No. 1. Depth, 2,635. I, 4.0 p. p. m.; Mn, 1.0 p. p. m.

1181-1182. Ellis Co. ½ mi. E. of Gage, SE. ¼ SW. ¼ sec. 2, T. 21 N., R. 24 W. Depth, 516 ft. Depth to sand, 506 ft. Flow, 15,000 bbls. per da. **1181.** SiO_2 Br, I., O. O. Alkalinity, as $CaCO_3$, 74.0 p. p. m. 1182. Hardness as $CaCO_3$, 1, 975 p. p. m. Foaming constitutents, 4,000 p. p. m.

1183. Mayes Co., Pryor Creek. Whitaker Park Well. Depth, 600 ft.

1184-1187. Murray Co., 8 mi. N. of Sulphur. Stuyvesant Oil Co. Well, SW. ¼ sec. 7, T. 1 N., R. 3 E. **1184.** Water from sand at 1,280-1,310 ft. **1185.** Water from sand at 1,427-1,575 ft. **1186.** Water from sand at 2,525 ft. Flow, 600 bbls. per da. **1187.** Free NH_3, 0,58 p. p. m. Albumenoid NH_3, 0.17 p. p. m.; NO_2 0.002 p. p. m.; NO_3, 0 p. p. m.; 0 consumed, 16.0 p. p. m. Alkalinity, 353.85 p. p. m. Water is very salty.

1188. Nowata Co., Nowata. Nowata Radium Sanitarium Co. Well. Depth, 1,315 ft. NH_4, 28.2 p. p. m.; NO_3, 97.8 p. p. m.

1189-1191. Ottawa Co. 1189. Afton. Old artesian well. Depth, 650 ft. H_2S, 10.0 p. p. m. **1190.** Fairland. Depth, 889 ft. **1191.** Miami. Deep well at ice plant.

1192-1193. Rogers Co. Claremore. **1192.** Claremore Radium Well Co. Well in NE. part of city. Depth, 1,500 ft. Pressure, 60 lbs. per sq. in. **1193.** Radium Water Co. Brown's Radium Well, in NE part of city. Depth, 1,150 ft.

BRINES. (1194-1226).

1194. Alfalfa Co. About 4 mi. E. of Cherokee. Twps. 26, 27 N., R. 10 W. on salt plains. R_2O_3, 36.0 p. p. m.

1195-1198. Blaine Co., near Ferguson. **1195-1196.** 4 mi. W. of Ferguson near head of Salt Creek, T. 18 N., R. 12 W. **1195.** W. canyon stream. R_2O_3, 176 p. p. m. **1196.** N. canyon stream. R_2O_3, 24. p. p. m. **1197.** Stream below junction of W. and N. canyon streams. R_2O_3, 28. ppm. **1198.** Well 5 ft. deep owned by A. Henquenet. Br, a trace.

1199-1202. Harmon Co., Salton. **1199-1200.** D. A. Thomas springs. **1199.** Spring No. 1. Br, a trace. Sampled '10. **1200.** Spring No. 2. **1201-1202.** W. H. Chaney's springs.

1203. Muskogee Co. Prairie Oil and Gas Co. Well. Depth, 1,569 ft. Yield, 50 bbls of brine per da. Sampled '10.

1204-1206. Nowata Co. Prairie Oil and Gas Co. Wells. Sampled '10. **1204.** Depth, 430 ft. Yield 4 bbls. brine per da. **1205.** Depth, 1,674 ft. Yield, 800 bbls. per da. **1206.** Well in NE. ¼ NE. ¼ sec. 14, T. 27 N., R. 14 E. Depth, 1,240 ft. Yield, 100 bbls. brine per da.

1207-1213. Okmulgee Co. Sampled '10. **1207-1208.** Prairie Oil and Gas Co. Wells. **1207.** Bryan. Depth, 1,674 ft. Yie'd, 80 bbls. brine per da. **1208.** Hamilton. Depth, 2,222 ft. Yield, 3 bbls. brine per da. **1209-1211.** Smith and Swan Well, E. ½ sec. 35, T. 13 N., R. 12 E. **1210-1211.** NaI and KCl, traces. **1212-1213.** Prairie Oil and Gas Co. Wells. **1212.** Depth, 1,587 ft. Yield 25 bbls. brine per da. **1213.** Depth, 2,007 ft. Yield, 40 bbls. brine per da.

1214-1215. Osage Co. Prairie Oil and Gas Co. Wells. Sampled '10. **1214.** Bartlesville. Depth, 1,565 ft. Yield 15 bbls. per da. **1215.** Hominy. Depth, 2,375 ft. Yield, 500 bbls. per da.

1216. Pawnee Co. Cleveland. Prairie Oil and Gas Co. Well. Depth, 1,750 ft. Yield, 50 bbls. per da. Sampled, '10.

1217-1221. Tulsa Co. Sampled '10. **1217-1220.** Prairie Oil and Gas Co. Wells. **1217.** Well in NE. ¼ SE. ¼ sec. 18, T. 17 N., R. 12 E. Depth, 1,557 ft. Yield, 6 bbls. brine per da. **1218.** T. 21 N. Depth, 1,148 ft. Yield, 7 bbls. brine per da. **1219.** Well No. 2. Depth, 1,178 ft. Yield, 500 bbls, per da. **1220.** Dawson. Depth, 1,150 ft. Yield, 10 bbls. brine per day. **1221.** Producers Oil Co. Well. Depth, ,200 ft. Yield, 200 bbls. brine per da.

1222-1224. Washington Co. Prairie Oil and Gas Co. Wells. Sampled '10. **1222.** Depth, 925 ft. Yield, 240 bbls. per da. **1223.** Depth, 1,305 ft. Yield, 25 bbls. per da. **1224.** Jefferson. Depth, 1,224 ft. Yield, 30 bbls. brine per da.

1225-1226. Woodward Co. 1225. Brine spring. **1226.** Spring N. of Woodward in sec. 33, T. 27 N., R. 19 W.

MINE WATERS. **(1227-1229).**

1227-1229. Ottawa Co. Miami. **1227-1228.** Chapman and Lennan Mine. H_2S, 2 ppm. $C0_2$, 22,0 ppm. **1229.** L. E. Church Mine. H_2S, 5.8 p. p. m. R_20_3, 0.2 p. p. m. HCO_3. 163.5 p. p. m.

OIL FIELD WATERS. **(1230-1255).**

1230-1232. Creek Co. Slick Oil Field, T. 15 N. R. 10 E. **1230.** Texas-Perryman Well No. 4, NE. ¼ sec. 17. Base of Dutcher sand, at 2,683 ft. **1231.** Phillips-Sewell Well No. 7, NW¼ sec. 16. Dutcher sand at 2, 679 ft. **1232.** Jackson-Wise, Robbins Well No. 7, SW. ¼ sec. 10. Glenn sand.

1233-1240. Noble Co., Tonkawa Oil Field, T. 24 N., R. 1 W. **1233-1236.** Comar Oil Co. **1233.** Carmichael Lease, Well No. 2, NW. corner NE ¼ sec. 3. Water sand at 1,570-1,590 ft. **1234.** Rusek Lease, Well No. 3, NE. corner SE. ¼ sec. 3. Middle Hoover sand. **1235-1236.** See Lease. Lower Hoover sand. **1235.** Well No. 2, NW. corner NW. ¼ sec. 15. **1236.** Well No. 3, near N. line NW. ¼ sec. 15. **1237.** Amerada Petroleum Corp., Smith Lease, Well No. 3, NW. ¼ NE. ¼ sec. 15. Lower Hoover sand, at 2,113 ft. **1238.** Comar Oil Co., See Lease near N. line NW. ¼ sec. 15, at 2,340-2,380 ft. **1239.** Southwestern Petroleum Co., Murray Lease, Well No. 1 SW. corner, SE. ¼ SW. ¼sec. 3, at 2,650 ft. Tonkawa sand. **1240. McCasky-**Wentz, Hayes Lease, Well No. 1, SE. ¼ SW. ¼ sec. 3 at 2,650 ft. in Tonkawa sand.

1241-1253. Okfuskee Co., Deaner Oil Field, T. 11 N. R. 11 E. **1241.** Atlantic No. 4, Jefferson farm, SW corner, NW ¼ sec. 16. Deaner sand, at 2,695 ft. **1242-1247.** Empire Gas and Fuel Co., Bell farm. **1242-1243.** Well No. 3, SE. corner NW. ¼ sec. 16. Kingwood sand. Yield, 6 bbls. per da. **1244.** Well No. 4, E. ½ NW. ¼ sec. 16. Water from above Kingwood sand. **1245-1246.** Well No. 5. Yield, 200 bbls. water per da. Kingwood sand. **1247.** Well No. 10, NE. corner NW. ¼ sec. 16. Water from above Kingwood sand. **1248-1253.** Kingwood, Hildebrandt farm, sec. 16. **1248.** Well No. 21, N. ½ SE. ¼. Yield, 20 bbls. per da. Deaner sand. **1249.** Well No. 27, W. ½ SE. ¼. Kingwood sand. **1250.** Well No. 30, SW. ¼ NE. ¼. Kingwood sand. **1251.** Well No. 31, NW. corner, W. ½ NE. ¼. Yield, 60 bbls. per da. Kingwood sand. **1252.** Well No. 32, NW. ¼ NE. ¼. Yield 60 bbls. per da. Kingwood sand. **1253.** Well No. 44. Yield, 50 bbls. per. da. Kingwood sand.

1254-1255. Stephens Co. Comanche Oil Field, sec. 20, T. 2 S., R. 7 W. Bottom water. **1254.** Comanche Petroleum Co.,

Clara Wilson No. 3; 150 ft. S. and 200 ft. E. of NW. corner sec. 20. Sand at 1,384-1,388 ft. **1255.** Weldon No. 1; 2,880 ft. S. and 990 ft. E. of NW. corner sec. 20. Sand at 1,422 ft.

POND WATERS. **(1256-1258).**

1256-1257. Grant Co. 1256. 1 mi. E. and ½ mi. N. of Lamont. **1257.** 5 mi. W. of Pond Creek.

1258. Logan Co. 5 mi. W. and 1 mi. S. of Langston.

SPRING WATERS. **(1259-1281).**

1259-1260. Blaine Co. 4 mi. W. of Ferguson, T. 18, N., R. 12 W. **1259.** Salt plain in N. canyon, sec, 23. **1260.** Head of Salt Creek in S. canyon.

1261-1262. Comanche Co. 1261. ½ mi S. of Lawton on Rock Island R. R. right-of-way. A terrace spring. **1262.** Dunbar limestone springs, NW. ¼ sec. 16, T. 2 N., R. 12 W.

1263. Johnston Co. Bromide spring at Bromide. 10 c. c. of H_2S gas per liter of water.

1264-1265. Kay Co. 1264. Limestone spring at Newkirk, NE. ¼ sec. 15, T. 28 N., R. 3 E. **1265.** Limestone spring at Uncas, SE. ¼ sec. 13, T. 27 N., R. 4 E.

1266. Lincoln Co. Sandstone spring at Baker, SE. ¼ sec. 14, T. 16 N., R. 5 E.

1267. Logan Co. Sandstone spring in lots 11 and 12; block 11, Guthrie.

1268-1270. Major Co. Tertiary springs at Ringwood.

1271-1272. Murray Co., Sulphur. **1271.** Bromide spring. **1272.** Pavilion spring.

1273-1276. Oklahoma Co. 1273-1275. 4 mi. NE. of Oklahoma City. **1273.** Spring No. 1. **1274.** Spring No. 2. **1275.** Spring No. 3. **1276.** 8 mi. N. of Oklahoma City.

1277. Pawnee Co. Sandstone spring at Pawnee, NE. ¼ sec. 12, T. 21 N., R. 5 E.

1278-1281. Woods Co. 1278-1279. Alva. **1278.** Elm Grove Spring. **1279.** 2 mi. N. of Alva. **1280-1281.** Whitehorse **1280.** Whitehorse springs, NW. ¼ sec. 21, T. 27 N., R. 16 W. **1281.** SE. ¼ sec. 7, T. 27 N., R. 16 W.

STREAM WATERS. **(1282-1348).**

1282. Beaver Co., Beaver Creek, N. Canadian River tributary, sec. 9, T. 4 N., R. 22 E.

1283-1285. Blaine Co. 1283. N. fork of Canadian River at Cantonment, sec. 29, T. 19 N., R. 13 W. **1284.** ½ mi. below salt springs, on Salt Creek, Cimarron River tributary, near Ferguuson, sec. 26, T. 18 N., R. 12 W. **1285.** N. Fork Canadian R. 4 mi NW of Watonga, T. 16 N., R. 12 W.

1286. Canadian Co., N. Fork of Canadian River, 2 mi. N. of El Reno, T. 13 N., R. 7 W.

1287. Cimarron Co., Cimarron River above salt plains, near Kenton, T. 5 N., R. 1 E.

1288. Cleveland Co., S. Canadian River at Noble, T. 8 N., R. 2 W.

1289-1290. Comanche Co. 1289. Cache Creek, Red River tributary, SE. ¼ sec. 29, T. 2 N., R 11 W. **1290.** Medicine Bluff Creek, Cache Creek tributary, 2 mi. above Ft. Sill in extreme NE. corner of T. 2 N., R. 11 W.

1291. Dewey Co., 3½ mi. E. and ½ mi. S. of Taloga, T. 18 N., R. 16 W., S. Canadian River.

1292-1295. Ellis Co. 1292. Boggy Creek, N. fork of N. Canadian River tributary, at Whitehead, near Fargo, sec. 24, T. 22 N., R. 23 W. **1293.** Wolf Creek, tributary to N. fork of N. Canadian River, 2 mi. N. of Whitehead, sec. 13, T. 22 N., R. 23 W. **1294.** Wolf Creek, at bridge N. of Gage, center sec. 3, T. 21 N., R. 24 W. **1295.** S. Canadian River at 100th meridian, sec. 7, T. 16 N, R. 26 W.

1296. Grady Co., S. Canadian River, 11 mi. S. of El Reno, T. 11 N., R. 7 W.

1297. Grant Co., Salt Fork of Arkansas River below Salt plains, ½ mi. E. of Pond Creek, on N. part of range line between ranges 5 and 6 W, T. 25 N.

1298-1300. Greer Co. 1298. N. fork of Red River, U. S. G. S. station at C. R. I. and P. R. R. bridge, E. of Granite, sec. 20, T. 6 N., R. 20 W. Mean results of samples taken over period of two years; Dissolved solids, 1,490 mg. per liter. Pct. of radicals in dissolved solids: Ca, 12; Mg, 3.9; Na, 13.9; K, O. 1; CO_3, 0.1; HCO_3 13.0; SO_4, 36.0; Cl, 19.0; NO_3, 0.0. **1299.** Elm Fork of Red River, N. of Mangum, at highway bridge in T. 5 N., R. 22 W. Mean results of samples taken over a period of 2 yrs. Dissolved solids, 9,130.0 mg. per liter. Pct of radicls in dissolved solids: Ca, 8.4; Mg. 1.7; Na, 22.7; K, 0.3; CO_3, 0.01; HCO_3, 1.7; SO_4, 21.0; Cl, 38.0; NO_3, tr. **1300.** Salt Fork of Red River, S. of Mangum, on N. line of T. 4 N., R. 22 W. Mean results of samples taken over a period of 1 yr. Dissolved solids in mg per liter, 2,300. Pct. of radicles in dissolved solids: Ca, 18.0; Mg, 4.0; Na, 6.6; K, 0.3; CO_3, 0.0; HCO_3, 6.2; SO_4, 52.0; Cl, 9.5; NO_3, 0.002.

1301-1303. Harper Co. 1301. Cimarron River above salt plains at C. D. Perry's ditch in T. 29 N., **1302.** Beaver Creek at mouth of Kiowa Creek on Twp. line between Twps. 26 and 27 N., R. 25 W. **1303.** Clear Creek, S. ½ sec. 24, T. 25 N., R. 25 W.

1304-1305. Jackson Co. 1304. N. of Red River at Navajo dam site W. of Headrick, sec. 25, T. 3 N., R. 19 W. Average

of samples collected over a period of 2 yrs. Dissolved solids, 3,590mg. per liter. Pct. of radicles in dissolved solids: Ca, 10.0; Mg, 2.2; Na+ K, 20; CO_3, 0.04; HCO_3, 5.3; SO_4, 26.0; Cl, 33.0; NO_3, 0.004. **1305.** Turkey Creek (Deep Red Run), Red River tributary near Olustee, at Fullerton dam. Average of samples taken over a period of 1 yr. Dissolved solids, 3,170 mg. per liter. Pct. of radicles in dissolved solids: Ca, 16.0; Mg, 3.4; Na+ K,8.6; CO_3, 0.0; HCO_3, 6.1; SO_4, 46.0; Cl, 12.0; NO_3, tr.

1306-1308. Kay Co. 1306. Chickasha River, tributary to Salt Fork of the Arkansas River, 11 mi, W. of Ponca City. **1307.** Arkansas River, 2 mi. E. of Ponca City, sec. 25, T. 26 N., R. 2 E. **1308.** Deer Creek, tributary of Salt Fork of Arkansas River, W. of Tonkawa in sec. 1, T. 25 N., R. 2 W.

1309. Kingfisher Co., Cimarron River below salt plains, 8 mi. N. of Kingfisher, in sec. 10, T. 17 N., R. 7 W.

1310-1313. Logan Co. 1310. Cimarron River, below salt plains, 2 mi, N. of Guthrie, in sec. 32, T. 17 N., R. 2 W. **1311.** Cottonwood Creek, tributary of Cimarron River, ½ mi. N. of Guthrie. **1312.** Cotton Creek N. of Guthrie. **1313.** Cimarron River below salt plains, 3 mi. east of Langston, sec. 16, T. 17 N., R 1, E. Langston, sec. 16, T. 17 N., R. 1 E.

1314. Major Co. Cimarron River at ford S. of Cleo, sec. 23, T. 22 N., R. 12 W.

1315. Noble Co. Red Rock, tributary of Arkansas River at Otoe school, sec. 3, T. 23 N., R. 2 E.

1316-1327. Oklahoma Co. 1316. Branch of Deer Creek (Mustang Creek), tributary of N. branch of N. Canadian River, NE. ¼ sec. 4, T. 12 N., R. 4 W. **1317.** N. Fork of N. Canadian River, 1 i. S. of Oklahoma City. **1318-1327.** N. Canadian River. **1318.** Sampled 3-26-'12. **1319.** Sampled 4-10-20-'12. **1320.** Sampled 5-26-27. **1321.** Sampled June '12. **1322.** Sampled July '12. **1323.** Sampled Aug. '12. **1324.** Sampled Sept. '12. **1325.** Sampled Oct. '12. **1326.** Sampled Nov. '12. **1327.** Sampled Dec. 12.

1328. Osage Co. Stream, 6 ft. deep, in Burbank Oil Field, sec. 13, T. 27 N., R. 8 E. Collected 12-6-'21. Na, 462.0 p. p. m.; Mg, 3.1 p. p. m.; Ca, 68.8 p. p. m.; SO_4, 25.1 p. p. m.; Cl, 624.0 p. p. m.

1329-1339. Payne Co. 1329. Council Creek, Cimarron River tributary, 3½ mi. NW. of Ingalls, sec. 4, T. 19 N., R. 4 E. **1330.** Salt Creek, tributary of Cimarron River, 10 mi. NE. of Ingalls, T. 19 N. R. 5 E. **1331.** Cimarron River, at crossing S. of Perkins. **1332.** Cimarron River, 2½ mi. SE. of Perkins, sec. 12, T. 17 N., R. 2 E. **1333.** Boomer Creek, Cimarron River tributary, ¼ mi. E. of Stillwater, sec. 24, T. 19 N., R. 2 E. **1334.** Little Stillwater Creek, Cimarron River tributary, ½ mi. S. of

Stillwater, sec. 23, T. 19 N., R. 2 E. **1337.** Wildhorse Creek, Cimarron River tributary, 11 mi. SW of Stillwater, sec. 30, T. 18 N., R. 2 E. **1338.** Black Bear Creek, Arkansas River tributaray, 2 mi. NW. of Stillwater. **1339.** Black Bear Creek, Arkansas River tributary, N. of Stillwater.

1340. Pottawatomie Co. N. fork of N. Canadian River at Shawnee.

1341-1342. Texas Co. 1341. Coldwater Creek, Beaver Creek tributary, which, in turn, is a tributary of the N. Canadian River, at Hardesty. **1342.** Paladuro Creek, Beaver Creek tributary, NE. ¼ sec. 23, T. 1 N., R. 18 E.

1343-1345. Woods Co. 1343. Salt Fork of Arkansas River above salt plains, at Alva. **1344.** Cimarron River, 4 mi. SW. of Waynoka, sec 8, T. 24 N., R. 16 W. **1345.** Dog Creek, tributary of Cimarron River, at Waynoka.

1346. Woodward Co. N. Fork of N. Canadian River at Woodward, sec. 25, T. 23 N., R. 21 W.

1347. Salt Fork of Arkansas River, S. of Ponca School at ford. Below salt plains.

1348. N. Canadian River at Sweeney (Oklahoma Co.?), SW. ¼ sec. 23, T. 12 N., R. 1 E.

WELL WATERS. **(1349-1463).**

1349. -Beaver Co., lot 14, blk. 106, Beaver, T. 4 N., R. 23 E.

1350-1352. Blaine Co. 1350-1351. Geary Mill and Elevator Co. plant well at Geary, T. 13 N., R. 11 W. **1352.** Well in S. canyon at head of Salt Creek near Ferguson.

1353. Caddo Co. Well S. of brick yard at Anadarko, center of T. 7 N., R. 10 W.

13541376. Cleveland Co. 1354-1374. Norman, T. 9 N, R. 2 W. **1354-1358.** Larsh's Addition to Norman. **1354.** Lot 8, blk. 10. **1355.** Lot 18, bl 11. **1356-1357.** Lot 19 blk. 12. **1358.** Lot 13. **1359-1361.** Elmwood Addition. **1359.** Lot 4. **1360.** Lot 6. **1361.** Lot 10. **1362.** City well. **1363.** SE. ¼ sec. 32, T. 9 N., R. 2 W. **1364.** Old city well. **1365.** Oil mill well (A. T. and S. Fe R. R. right-of-way and Gray St.) **1366.** SE. ¼ sec. 19, T. 9 N., R. 2 W. **1367** SW¼ sec. 24, T. 9 N., R. 3 W. **1368.** NW¼ sec. 31, T.9 N.,R. 2 W. **1369.** University Campus Well. **1370.** Old city well, just W. of town, corner Flood and Symmes Sts. **1371.** New water works well. **1372.** Old well of Norman Milling and Grain Co. between Main and Comanche Sts. **1373.** Walkers Boarding House Well at 404 S. Webster St. **1374.** Laundry Well at 121 E. Gray St. **1375.** Box, NE. ¼ sec. 25, T. 6 N., R. 1 E. **1376.** Noble, Lot 9, blk. 29.

1377-1385. Comanche Co. 1377. Ft. Sill at C. R. I. and

P. R. R. depot. **1378-1385.** Lawton. **1378.** SW. ¼ sec. 29, T. 2 N., R. 11 E. **1379.** NW. ¼ sec. 29, T. 2 N., R. 11 W. **1380.** SW. ¼ sec. 20, T 2 N., R. 11 W. **1381.** N. ½ sec. 14, T. 2 N., R. 11 W. **1382-1385.** Beals Addition. **1382.** Lot 3, blk. 5 **1383.** Lot 3, blk 6. **1384.** Lot 16, blk. 4. **1385.** Lot 1, blk. 13.

1386. Dewey Co. 13 mi. E. and 1 mi. S. of Taloga.

1387-1388. Ellis Co. 1387. Gage Water Supply Wells along Wolf Creek. Depth, 39 ft. in alluvium. Na, 14.0 p. p. m.; Cl, 21.0 p. p. m.; SO_4, 28.0 p. p. m.; HCO_3, 261.0 p. p. m.. **1388.** 3 mi. S. of Gage, farm of E. J. LaLane, SE. ¼ sec. 21, T. 21 N., R. 24 W. Well is 156 ft. deep in Tertiary beds. Na, 25.0 p. p. m.; Cl, 14.0 p. p. m.; SO_4, 27.0 p. p. m.; HCO_3, 256.0 p. p. m.; Fe, 17.0 p. p. m. Hardness as $CaCO_3$, 207.0 p. p. m.; Dissolved solids, 330.0 p.p. m.

1389. Garfield Co. Enid. City test well in T. 22 N., R.7 W.

1390-1391. Grant Co. 1390. 1 mi. E. of Pond Creek. **1391.** C. R. I. and P. depot well at Pond Creek.

1392-1395. Kay Co. 1392. Bernice, town well. Na, 10.5 p. p. m.; K, 6.1 p. p. m.; Ca 51.5 p. p. m.; Mg, 7.0 p.p. m.; Cl, 7.8 p. p. m.; CO_3, 110.1 p. p. m.; SO_4, 8.5 p. p. m.; CO_2, 39.0 p. p.m.; H_2S, present. **1393-1395.** Newkirk. **1393.** Lot 19, blk. 4. **1394.** Blk. 50. **1395.** NE. ¼ sec. 6, T. 28 N., R. 2 E.

1396-1399. Kingfisher Co. 1396. Downs, sec. 1, T. 15 N., R. 5 W. **1397.** Kingfisher. **1398.** 6 mi. E. and 2½ mi S. of Kingfisher. **1399.** Omega, sec. 7, T. 16 N., R. 9 W.

1400. Kiowa Co. Secs. 11 and 12, T. 2 N., R. 17 W.

1401-1404. Logan Co. 1401. Guthrie city park well. **1402.** Guthrie city water supply. **1403.** Langston. **1404.** Mulhall. Analysis in parts per million is as follows: P_2O_5, 0.0; Fe_2O_3, 21.0; NH_3, 7.6; Albumenoid NH_3, 1.4; NO_2, 0.0; NO_3, 0.0; CaO, 4,556.0; MgO, 230.0; SO_3, 2,527.0; SO_2, 0.0; NaCl, 24,960.0; KCl, 2,483.0; I, 97.0; Br, 33.3; Cl, 45,638.

1405-1407. Major Co. 1405. 9 mi. E. and 6½ mi. N. of Cleo. **1406.** Town well of Cleo, T. 22 N., R. 12 W. **1407.** Ringwood, sec. 14, T. 22 N., R. 10 W.

1408-1412. Noble Co. 1408. Billings, sec. 14, T. 23 N., R. 3 W. **1409.** Billings, SE. ¼ sec. 29, T. 24 N., R. 2 W. **1410.** Perry, NW¼ sec. 22, T. 21 N., R. 1 W. **1411.** Red Rock. **1412.** Red Rock, NE. ¼ sec. 25, T. 23 N., R. 2, E.

1413-1440. Oklahoma Co. 1413. Choctaw City, lot 8, blk. 28. **1414-1440.** Oklahoma City and vicinity. **1414.** NE.¼ sec. 4, T. 12 N., R. 4 W. **1415-1416.** Sec. 9, T. 12 N., R. 4 W. **1417-1418.** Sec. 33, T. 12 N., R. 3 W. **1419-1424.** Wells in N. Canadian River Valley alluvium. **1419.** Kings Laundry. **1420.**

Palace Laundry. **1421.** Morris Packing Co. **1422.** Gas Plant. **1423.** New State Laundry. **1424.** A. T. & S. Fe. R. R. **1425-1440.** Red Bed Wells. **1425.** 1234 E. 8th St. Depth, 90 ft. Collected 8-23-'11. **1426.** 1340 W 17th St. Depth 190 ft. Collected 2-20-11. **1427.** 1307 N. Klein St. Depth, 200 ft. Collected 2-17-'11. **1428.** 1225 W. 28th St. Depth, 125 ft. Collected 2-27-'12. **1429.** 13th and Western Sts. Depth, 200 ft. **1430.** 5 mi. S. of city. Depth, 125 ft. Collected 8-3-'12. 1431. 1415 W 39th St. Depth 125 ft. Collected 2-23-'11. **1432.** 733 E. 8th Street, Depth 90 ft. **1433.** 1415 W 16th St. Depth 125 ft. Collected 8-15-'10. **1434.** 736 E. 6th St. Depth, 100 ft. Collected 613-'11. **1435.** 2½ mi. W. of city. Depth, 200 ft. Collected 12-27-'10. **1436.** 7 mi. SW. of city. Depth, 480 ft. Collected 8-1-'11. **1437.** 7 mi. NE. of city. Depth, 85 ft. Collected 8-28-'10. **1438.** 120 N. Francis St. Depth, 10 ft. Collected 11-9-'10. **1439.** Depth, 275 ft. Collected 3-9-'12. **1440.** 1600 E. 15th St. Depth 125 ft. Collected 2-10-'12.

1441-1446. Pawnee Co. 1441-1443. Blackburn. **1441.** Sec. sec. 1, T. 21 N., R. 6 E. **1442** NW ¼ sec. 30, T. 22 N., R. 7 E. **1443.** Sec. 10, T. 22 N., R. 7 E. **1444.** 1½ mi. W. of Jennings **1445.** Pawnee, SE. ¼ sec. 36, T. 22 N. R. 4 E. **1446.** Valley. NE. ¼ sec. 14, T. 21 N., R. 6 E.

1447-1452. Payne Co. 1447. Cushing NW ¼ sec. 5, T. 16 N., R. 5 E. **1448.** Perkins, NE. ¼ sec. 14, T. 17 N., R. 2 E. **1449.** 1 mi. N. of Stillwater. **1450.** Stillwater. **1451.** 11 mi. SW. of Stillwater. **1452.** Stillwater, NW. ¼ sec. 8, T. 20 N., R. 2 E.

1453-1455. Pottawatomie Co. 1453. Pink, NW. ¼ sec. 17, T. 9 N., R. 2 E. **1454.** Tecumseh, lot 12, blk. 33. **1455.** Tecumseh, NW. ¼ sec. 18, T. 8 N., R. 4 E.

1456. Texas Co., Guymon, well in city square, sec. 36, T 3 N., R. 15 E.

1457-1459. Tillman Co., Madden, T. 2 S., R. 19 W. **1457.** Sec 20. **1458.** Sec. 19. **1459.** Sec. 20.

1460-1462. Woods Co. 1460-1461. Alva. **1460.** Lots, 13 and 14, blk 16.

1461. Lot 1, blk. 1, Ament's Addition. **1462.** Lesley.

1463. Woodward Co. Woodward.

IRON-NICKEL METEORITES. **(1464-1465).**

1464. Found in sec. 1, T. 1 S., R. 26 E.

1465. Found near Knowles, Beaver Co. Now in Memorial Hall of American Museum of Natural History, N. Y.

PART II. TABULATED CHEMICAL ANALYSES
ABBREVIATIONS AND TERMINOLOGY

Unless otherwise noted, all analyses are given in per cent, i. e. in parts of the constituent named, in one hundred parts of the material taken for analysis. The exceptions to this rule are, in general, as follows: Gold and silver are quoted in Troy ounces of the metal in an Avordupois ton of the material analyzed; oil from oil shales is quoted in United States gallons per Avoirdupois ton of the shale; the constitutents of water are quoted either in parts of the substance in one million parts of the water or in grains of the substance in one United States gallon of the water.

General Abbreviations

Chem. refers to chemist; **Col.** to collector; **Pub.**, to publication cited.

Special Abbreviations

Org. refers to organic matter; **L. O. I.**, to loss on ignition; **Res.**, to residue or residual; **R_2O_3**, to iron and aluminum oxides, Fe_2O_3 plus Al_2O_3.

Coal Analyses Abbreviations

V. C. M. refers to Volatile Combustible Matter; **F. C.** or **Fixed C.**, to Fixed Carbon; **B. T. U.**, to British Thermal Units per Avordupois pound of coal.‡

Gas Analyses Abbreviations

Sp. G., refers to specific gravity of the gas compared with air as unity; **B. T. U.**, to British Thermal Units per cubic foot of the gas.

Oil Analyses Abbreviations

Gas. refers to gasoline fraction cut at 150 degrees Centigrade; **Ker.**, to Kerosene fraction cut between 150 degrees and 300 degrees Centrigrade; **Res.**, to residue left after the two preceeding fractions have been removed; **Asp.**, to asphalt; **Par.**, to paraffin; **Be'** to Baume' gravity in degrees.

NOTE: In general, analyses are quoted as originally given exxcept where, in the original form, they do not fit in these tables. In the latter case they are recalculated and the literature must be construed for the original form of expression.

Serial	1	2	3	4	5	6	7	8	9	10
Chem.	72	72	72	29	77	29		72	72	72
Col.	59	33	34		37			63	63	34
Pub.	71	72	8	56	56	56	11			8
SiO_2	50.96	49.60	47.44	63.04	73.61	74.14	71.10	72.96	72.50	76.86
Al_2O_3	17.54	15.86	16.59	14.30	11.97	12.97		12.91	12.08	12.76
Fe_2O_3	3.01	0.72	0.00	1.25	2.34	1.07	20.60	0.60	0.42	0.63
FeO	7.46	17.84	4.87	6.12	1.51	1.20		0.90	0.97	1.05
MgO	5.17	1.92	8.29	1.75	0.19	tr	0.99	tr	0.00	tr
CaO	9.18	7.03	6.02	4.38	1.38	0.48	2.53	0.73	1.08	0.43
Na_2O	2.78	0.92	5.84	3.57	3.76	4.61		2.96	2.91	5.67
							3.76			
K_2O	0.54	2.12	0.53	3.17	4.32	5.30		4.40	5.67	1.43
H_2O-	0.48	0.42	0.12	0.05	0.32	0.12		0.41	0.62	0.12
							1.11			
H_2O+	0.38	1.98	3.97	0.72	0.35	0.19		4.33	3.75	1.09
TiO_2	1.31	0.65	0.89	1.43	0.46	0.25		0.14	0.12	0.18
P_2O_5	0.54	0.21	0.13	0.28	0.15	tr		tr	0.00	0.04
MnO	0.15	0.09	0.10	0.09	0.09	0.03		0.04	0.02	tr
Res.	0.12	0.25	5.65		0.06					
Total	99.62	99.61	100.44	100.15	100.51	100.36	100.09	100.38	100.14	100.26

Serial	11	12	13	14	15	16	17	18	19	20
Chem.	3	3	3	3	3	3	3	3		22
Col.	9	9	9	9		9	9	9		
Pub.	3	3	3	3		3	3	3	39	
SiO_2	79.52	70.12	70.44	72.18	68.61	68.823	68.64	71.68	50.36	10.68
Al_2O_3									33.38	
	11.56	15.80	16.12	14.50	19.23	13.316	14.64	14.92		23.49
Fe_2O_3									3.31	
MgO		0.23				0.192	0.23			
CaO	1.08	0.52	0.58	0.54	0.56	0.960	0.90	0.76		
									0.88	35.55
Na_2O		4.429				3.231				
K_2O		3.016				3.572				
SO_3	0.78	1.168	1.26	0.597		2.130	2.45	0.65		
H_2O	3.06	6.42	6.17	5.05	8.01	8.223	9.88	5.57	12.05	
Total	96.00	101.703	94.57	92.867	96.41	100.447	96.74	93.58	99.98	69.72

Serial	21	22	23	24	25	26	27	28	29	30
Chem.	73	72	72	72	72	72	73	73	73	73
Col.		22&66	22&66	22&66	22&66	22&66				
Pub.	36			50			36	36	36	36
SiO_2 Res	0.65	0.47	0.16	0.02	0.02			0.33	1.69	0.46
$Al_2O_3+Fe_2O_3$									0.78	
MgO							0.66	1.51	1.02	
CaO	32.96	32.30	36.73	32.42	32.30	32.41	39.06	38.19	36.51	32.81
H_2O	19.82	20.72	10.03	21.14	20.92	21.25	2.74	3.15	5.38	20.22
CO_2	tr	tr	tr	0.12				1.64	2.61	
SO_3	47.13	46.12	53.44	46.11	46.11	46.28	57.04	54.54	49.40	46.85
Total	100.56	99.61	100.36	99.81	99.35	99.94	99.50	99.36	97.39	100.34

Serial	31	32	33	34	35	36	37	38	39	40
Chem.	73	73	73	73	73	73	73	73	72	72
Col.									22&66	22&66
Pub.	36	36	36	36	36	36	36	36	50	50
SiO_2Res	0.67	0.35	0.41	0.34	0.16	0.87	0.86	0.39	0.24	0.12
$Al_2O_3+Fe_2O_3$			1.38						0.21	
MgO			0.97	0.47	0.69					
CaO	39.10	33.29	32.30	32.22	36.78	32.22	33.02	32.57	32.27	32.07
H_2O	4.95	20.89	18.23	20.75	9.33	21.22	20.00	21.00	20.67	21.41
SO_3	55.84	47.53	46.11	46.01	52.52				0.45	
CO_2			1.06	0.51	0.75	46.00	47.14	46.50	45.30	45.80
Total	100.56	102.06	100.46	100.30	100.23	100.31	101.02	100.46	99.14	99.40

Serial	41	42	43	44	45	46	47	48	49	50
Chem.	73	73	73	73	72	73	73	73	72	72
Col.					22&66				22&66	22&66
Pub.	36	36	36	36	36	36	36	36		
SiO_2Res	1.02	1.66	0.41	1.22	12.14	0.18	0.95	4.54	0.26	0.79
$Al_2O_3+Fe_2O_3$	0.61	0.45	0.67	8.30	1.69		1.45	2.52		0.37
MgO	0.40	0.19	0.28	0.68	0.08		0.40	0.76	1.84	
CaO	33.14	31.76	31.87	37.40	29.20	32.48	31.62	30.97	32.42	32.13
CO_2	2.21	0.70	0.00	21.29	4.03	20.94	19.80	17.32	18.56	20 55
SO_3	43.79	44.43	46.06	16.03	33.59		0.44	0.82	4.66	0.76
Total	99.78	99.41	100.07	102.28	97.95	46.39	45.14	44.23	41.43	45.07

Serial	51	52	53	54	55	99.99	99.80	101.16	99.17	99.67
H_2O	18.61	20.22	20.78	17.36	17.20	56	57	58	59	60
Chem.	64	72	4	72						
Col.		22&66		53						
Pub.	33		63					4		
SiO_2	7.91	18.05	10.67	8.49	20.32	4.28			18.22	
Al_2O_3		2.53		1.91						
	2.11		0.60		5.16	0.60			5.43	
Fe_2O_3		1.63		0.26						
MgO	0.23		0.51	6.38	20.21	0.97	19.20	14.30	3.04	
CaO	29.54	25.75	30.20	42.00	25.38	51.24	29.40	33.10	45.12	55.2
H_2O	18.58	17.72	16.59	0.13	0.96					
CO_2	0.29	2.36	5.08	40.03	28.93	41.12			28.19	43.3
SO_3	40.51	31.19	34.98	0.00		0.27				
Res.	0.49	0.03		0.52						
Total	99.66	99.26	98.63	99.72	100.00	99.44	48.60	47.40	100.00	98.5

NOTE: In no. 51, Res. is Na_2O: In no. 52, Res. is P_2O_5, 0.033: In no. 54, Res. is FeO, 0.44; TiO_2, 066; P_2O_5, 0.012; H_2O+, tr; MnO, tr.

Serial	61	62	63	64	65	66	67	68	69	70
Chem.				72	11	11	11	11	11	11
Col.				53						
Pub.		17	36				47	7	32	32
SiO_2	45.91		1.82	0.88	6.94	2.96	4.35	11.92	8.50	11.92
Al_2O_3				0.00	2.44	0.63	1.73		3.40	
	4.26	1.91	1.35		1.36	1.11				6.45
Fe_2O_3				0.05			1.14	6.46	3.20	
MgO	10.18	0.55	25.28	20.08	1.09	0.51		1.23		1.23
CaO	23.24	54.87	23.79	31.96	48.34	52.50	51.56	55.24	45.50	44.24
H_2O			1.82	0.16						
CO_2	16.41	43.07	46.26	45.72	39.52	42.16	40.46	36.29	35.70	36.29
Res				1.18	0.90	0.05			1.60	
Total	100.00	100.40	100.32	100.03	100.59	99.92	99.24	111.14	100.00	100.13

NOTE: Res. in no. 64 is FeO, 0.08; H_2O++ Organic matter, 0.51; P_2O_5, 0.59; TiO_2, 0.00; MnO, tr; Res. in no. 65 is SO_3: Res. in no. 66 is SO_3: Res. in no. 69 is S 0.25 "Alkali," 1.35.

Serial	71	72	73	74	75	76	77	78	79	80
Chem.	11	72					62	72	72	72
Col.		63						41	41	53
Pub.	32			4	4	4	32			
SiO_2	1.40	12.90	5.10	3.14	1.3	0.25		0.65	0.29	1.01
Al_2O_3		3.72						0.29	0.28	0.38
	0.92		3.06	2.60	1.0	1.28				
Fe_2O_3		1.34						0.14	0.23	0.68
FeO								0.24		
MgO	tr	0.69	23.61	27.50	0.6	0.48		0.48	0.20	0.53
CaO	54.65	44.85	35.22	47.20	54.8	54.29	55.63	54.86	55.39	54.57
H_2O-		0.32						0.05	0.05	0.08
H_2O++ Org.		0.71						tr	0.21	tr
TiO_2		0.13						0.00	n.d	0.00
CO_2	43.29	35.10	33.00	20.82	43.0	43.12	43.66	43.72	43.78	43.54
P_2O_5		0.065						0.009	0.013	0.037
MnO		? 0.035						0.05	0.026	0.044
Total	100.26	99.86	99.99	101.26	100.7	99.42	99.29	100.489	100.469	100.871

Serial	81	82	83	84	85	86	87	88	89	90
Chem.	72	72	72	72	72	72	72	72		29
Col.	53	53	53	53	53	53	53	53		
Pub.										37
SiO_2	1.31	3.10	2.58	6.42	8.62	27.48	13.32	5.44	18.23	
Al_2O_3	0.48	0.78	0.56	1.03	1.42	4.16	2.81	0.89		
Fe_2O_3	0.13	0.68	0.02	0.75	0.27	2.05	0.32	0.54	15.81	
FeO	0.29		0.52		0.35		0.81	0.29		0.28
MgO	0.40	0.54	0.14	0.55	0.54	0.71	tr	0.57	12.05	0.30
CaO	54.82	53.10	54.02	50.71	49.60	35.11	45.72	51.20	30.23	40.56
H_2O-	0.14	0.11	0.14	0.17	0.31	1.31	0.80	0.12		
H_2O+						0.28	tr	0.00		
	tr	tr	tr	0.03	tr					
Organic										
TiO_2	0.00	0.00	0.00	tr	0.09	0.13	0.13	tr		
CO_2	43.20	42.40	42.56	40.53	39.68	28.42	36.00	40.95	22.68	32.30
P_2O_5		0.041		0.04		0.079		0.028		
MnO	0.052	0.044	0.052	0.057	0.067	0.093	0.07	0.09		0.39
Total	100.822	100.795	100.592	100.287	100.957	99.822	99.98	100.118	99.00	73.83

Serial	91	92	93	94	95	96	97	98	99	100
Chem.	29	29	72	72	70	16	23	23	72	72
Col.			53	25					55	72
Pub.	37	37					47	47		
SiO_2			40.58	0.75	0.45	4.97	2.06	2.62	5.71	9.34
Al_2O_3			7.17	1.15	0.56	2.33	1.52	1.76	2.00	0.78
Fe_2O_3				tr						1.28
FeO	3.45	4.02		2.53	3.20					
MgO	12.15	14.35	1.84	3.81	2.65	2.33	0.53	0.62	19.35	
CaO	29.02	29.02	25.34	48.46	49.11	45.90	53.40	52.70	28.79	48.57
H_2O			0.33	tr		0.06				0.22
H_2O++Org.			0.90	2.04						
CO_2	43.79	44.89	21.96	41.42	44.00	41.28	42.48	42.02	44.11	38.11
MnO	9.08	6.42		0.135						
Res.			0.116	0.045						
Total	97.49	98.70	98.236	100.34	99.97	96.87	99.99	99.72	99.96	98.30

NOTE: Res. in No. 93 is TiO_2; Res. in No. 94 is P_2O_5.

Serial	101	102	103	104	105	106	107	108	109	110
Chem.	72	72	72	9	72	72		57	57	72
Col.	72	63	63		2	2				2
Pub.								47	47	
SiO_2	7.28	2.28	4.15	4.38	1.47	13.75		2.48	4.30	2.58
Al_2O_3	0.98	0.56	0.66	0.82	0.95	7.04		0.71	1.20	1.10
Fe_2O_3	0.97	0.38	2.20					0.79	1.20	
MgO	0.59	0.00	0.55	0.22	tr			1.30	0.29	tr
CaO	50.16	54.30	50.70	52.97	51.63	44.09	48.18	52.35	51.49	52.08
H_2O-	0.09	0.07	0.15							
H_2O++Org		0.97	0.70							
CO_2	40.01	41.27	40.20	41.63	45.96	34.61	37.82	42.09	40.72	44.23
P_2O_5		0.26	0.14							
SO_3								0.54		
MnO		0.00	0.20							
Total	100.08	100.09	99.65	100.02	100.01	99.49	86.00	100.66	99.20	99.99

Serial	111	112	113	114	115	116	117	118	119	120
Chem.	72		72	72	72		29		3	39
Col.	2		53	53	53				48	
Pub.							37			32
SiO_2	4.99	15.52	0.16	40.85	39.03	16.22		25.84	1.29	0.80
Al_2O_3	1.10	10.61	0.12	3.48	3.49	10.51		23.08	0.21	0.00
Fe_2O_3			0.01	0.43	0.19				0.302	0.52
FeO			0.04	0.74	1.01		4.02			
MgO	tr	2.50	0.04	1.02	1.15	22.08	6.02	3.47	0.33	0.23
CaO	50.93	42.18	55.90	28.09	28.92	26.13	41.82	36.84	54.26	54.81
H_2O			0.03	0.23	0.25				1.67	
CO_2	43.69	29.19	44.06	23.89	24.40	25.05	42.25	9.56	41.94	43.28
MnO			0.01	0.01	0.01		0.60			
TiO_2			0.00	0.266	0.266					
P_2O_5			0.037							
Total	100.71	100.00	100.407	99.006	98.7160	100.00	94.71	98.79	100.00	99.64

Serial	121	122	123	124	125	126	127	128	129	130
Chem.	13	81					72		13	81
Col.							53			
Pub.	32	32		17		17		17		32
SiO_2	0.42		15.21		4.61	0.80	0.49		1.30	1.10
Al_2O_3	0.71	0.87	25.62	1.75	1.22	0.52	0.16	2.61	1.40	0.26
Fe_2O_3	0.10						tr			
FeO							0.18			
MgO	0.28	0.60	2.82	1.16	6.74	0.49	0.41	1.19		0.40
CaO	55.08	54.42	33.16	54.85	57.24	54.81	54.77	53.90	52.19	55.20
H_2O		0.59				0.10	0.38			
CO_2	43.11	43.36	23.19	42.24	29.19	43.02	43.38	42.30	43.30	43.14
Res.	0.32						0.049			
Total	100.02	99.84	100.00	100.00	99.00	99.74	99.819	100.00	98.19	100.10

NOTE: Res. in No. 121 is PbO. Res. in No. 127 is P_2O_5, 0.041; MnO, 0.008. Also H_2O in No. 127 consists of H_2O--, 0.05 and H_2O++Organic Matter, 0.33. There is no TiO_2 in No. 127.

Serial	131	132	133	134	135	136	137	138	139	140
Chem.	81	81	81	45		72	72	72		72
Col.						63	63	63		26
Pub.	32	32	32	32						
SiO_2	0.90	1.70	2.62	1.10	7.01	7.01	12.23	1.32	2.60	8.14
R_2O_3				0.60		2.32	1.41	0.28	0.10	0.57
Al_2O_3	0.10	0.12	0.18		2.82					
Fe_2O_3				0.10		0.00	0.54	0.09	0.30	0.06
FeO						1.04	0.91	0.22		0.26
MgO	1.50	0.70	0.75	1.10	8.15	1.01	1.08	0.76		0.63
CaO	53.80	53.10	53.53	54.70	50.19	49.08	45.97	54.50	54.34	50.35
H_2O						0.25	0.32	0.09		0.08
H_2O++						1.52	1.33	0.13		0.86
Org.										
TiO_2						0.07	0.076	tr		tr
CO_2	43.14	44.34	42.92	42.10	30.73	38.06	35.50	42.85	42.64	39.10
P_2O_5						0.114	0.312	0.078		0.096
MnO						tr	0.074	0.022		0.13
Total	99.44	99.96	100.00	99.70	98.90	100.474	99.752	100.34	99.98	100.276

Serial	141	142	143	144	145	146	147	148	149	150
Chem.	72			72	9	9	9	9	9	9
Col.	53			59	9	9	9	9	9	9
Pub.		16			2	2	2	2	2	2
SiO_2	10.53	0.32	11.10	10.04	99.22	97.192	99.305	98.360	95.785	95.82
Al_2O_3	1.87	0.26	3.00	0.30	0.32	1.222	0.353	0.661	0.421	0.335
Fe_2O_3					0.14	0.868	0.07	0.042	0.042	0.028
MgO	0.84		22.50	0.42	tr	0.021	0.0137	0.068	0.026	0.028
CaO	47.41	56.12	37.70	49.37	0.18	0.105	0.138	0.490	2.075	2.137
H_2O	0.23			0.27						
H_2O+	0.03									
Organic				1.03	0.0028	0.516	0.012	0.011	0.013	0.0098
CO_2	38.00	44.06	21.30	38.32					1.57	1.682
Total	98.91	100.76	95.60	99.75	99.8628	99.924	99.8917	99.632	99.932	100.0398

Serial	151	152	153	154	155	156	157	158	159	160
Chem.	9	9	9	9	9	9	9	9	9	
Col.	9	9	9	9	9	9	9	9	9	9
Pub.	2	2	2	2	2	2	2	2	2	99.95
SiO_2	98.586	83.787	98.706	99.349	99.585	96.525	94.07	87.337	98.706	
Al_2O_3	0.421	0.48	0.349	0.213	0.249	0.75	0.216	0.215	0.349	0.08
Fe_2O_3	0.042	0.063	0.084	0.07	0.084	0.133	0.042	0.028	0.084	
MgO	0.173	0.054	0.017	0.019	0.026	0.026	0.079	0.011	0.017	
CaO	0.44	8.81	0.463	0.188	0.028	1.425	3.146	6.945	0.463	
Org.	0.0091	0.0063	0.021	0.029	0.0018	0.00054	0.0014	0.001	0.0027	
CO_2	0.34	6.937	0.36	0.148	0.035	1.135	2.4771	5.474	0.3734	100.03
Total	100.0111	100.1373	100.000	100.016	100.0088	99.9994	100.0315	100.011	99.9951	
Serial	161	162	163	164	165	166	167	168	169	170
Chem.	9	9	9	9	9	9	9	9		9
Col.	9	9	9	9	9	9	9	9		9
Pub.	2	2	2	2	2	2	2	2		2
SiO_2	99.469	92.941	97.844	99.03	99.362	93.236	94.56	70.554	99.21	98.782
Al_2O_3	0.161	0.091	0.176	0.152	0.08	0.087	0.11	0.097	0.40	0.56
Fe_2O_3	0.042	0.042	0.07	0.028	0.14	0.056	0.112	0.056		0.35
MgO	0.03	0.031	0.054	0.119	0.039	0.042	0.04	0.098		0.188
CaO	0.15	3.887	1.04	0.37	0.2	3.687	2.637	16.27		0.065
Org.	0.0018	0.0032	0.0097	0.008	0.005	0.009	0.486	0.32	0.14	0.008
CO_2	0.1377	3.0767	0.8469	0.353	0.178	2.925	2.097	12.863		0.149
H_2O									0.25	
Total	99.9915	100.719	99.0406	100.06	100.004	100.042	100.042	100.258	100.00	100.102

Serial	171	172	173	174	175	176	177	178	179	180
Chem.	72	9	9	9	9	9	9	9	9	9
Col.	52	9	9	9	9	9	9	9	9	9
Pub.		2	2	2	2	2	2	2	2	2
SiO_2	99.63	99.49	87.46	99.267	95.94	88.947	79.357	91.21	99.19	99.34
Al_2O_3	0.17	0.136	0.185	0.179	0.255	0.277	0.383	0.214	0.284	0.146
Fe_2O_3	0.05	0.014	0.07	0.014	0.028	0.056	0.14	0.056	0.056	0.084
MgO	0.02	0.077	0.0518	0.021	0.0771	0.0645	0.699	0.0427	0.0355	0.044
CaO	0.03	0.15	6.86	0.275	2.075	5.925	11.225	4.755	0.225	0.225
Org.	0.056	0.008	0.012	0.005	0.008	0.034	0.0098	0.0053	0.0011	0.0029
CO_2	0.034	0.158	6.07	0.239	1.714	4.736	8.915	3.79	0.2158	0.2256
Total	100.05	100.033	100.7088	100.00	100.0971	100.0395	100.7288	100.073	100.0074	100.068
Serial	181	182	183	184	184	186	187	188	189	190
Chem.	9	9	9	9	9	9	9	9	9	9
Col.	9	9	9	9	9	9	9	9	9	9
Pub.	2	2	2	2	2	2	2	2	2	2
SiO_2	98.058	98.24	98.872	99.388	97.986	99.256	98.592	99.406	98.82	96.81
Al_2O_3	0.162	0.988	0.59	0.228	1.6	0.242	0.596	0.277	0.464	0.551
Fe_2O_3	0.084	0.28	0.252	0.112	0.154	0.168	0.434	0.056	0.126	0.182
MgO	0.028	0.032	0.028	0.0453	0.059	0.099	0.065	0.068	0.0246	0.0337
CaO	0.94	0.13	0.09	0.135	0.112	0.135	0.175	0.11	0.31	1.35
Org.	0.0084	0.229	0.104	0.0027	0.0041	0.004	0.0082	0.0014	0.01	0.0091
CO_2	0.7706	0.137	0.101	0.1557	0.114	0.214	0.2086	0.1575	0.2709	1.0996
Total	100.051	100.036	100.037	100.0667	100.0291	100.118	100.0788	100.0759	100.0255	100.0354

Serial	191	192	193	194	195	196	197	198	199	200
Chem.	9	9	9	6	9	9	9	9	9	9
Col.	9	9	9	52	9	9	9	9	9	9
Pub.	2	2	2		2	2	2	2	2	2
SiO_2	96.184	86.287	92.377	97.62	99.507	98.593	99.077	99.123	96.988	98.878
Al_2O_3	0.61	0.163	0.141	1.82	0.152	0.75	0.497	0.468	1.88	0.73
Fe_2O_3	0.406	0.07	0.112	0.14	0.098	0.322	0.133	0.112	0.42	0.21
MgO	0.088	0.03	0.0282	0.00	0.056	0.025	0.021	0.052	0.04	0.032
CaO	1.512	7.5	4.125	0.24	0.04	0.105	0.105	0.115	0.22	0.105
Org.	0.012	0.0064	0.0042	0.36	0.117	0.123	0.085	0.04	0.28	0.132
CO_2	1.286	5.9382	3.2787		0.092	0.110	0.105	0.147	0.217	0.117
Total	100.098	99,9946	100.0661	100.18	100.062	100.028	100.023	100.057	100.045	100.204

Serial	201	202	203	204	205	206	207	208	209	210
Chem.	9	9	72	72	72	72	72	72	72	72
Col.	9	9	55	63	63	34	34	34	34	34
Pub.	2	2								
SiO_2	98.89	99.496	56.86	65.90	87.87	90.56	87.66	68.70	91.8	60.00
Al_2O_3	0.636	0.174	0.92	2.20	1.57	7.23	0.22			
Fe_2O_3	0.154	0.126		8.91	7.35	2.13	7.14			
MgO	0.061	0.057	8.53							
CaO	0.1	0.07	13.23			0.00	0.00			
Org.	0.08	0.022								
CO_2	0.145	0.117	20.25	4.26	0.48		1.40 (Loss On Ignition)			
P_2O_5						0.02	0.188			
CuO				15.41	1.28	0.10	0.86	1.80	0.0	0.0
H_2O-				0.36	.43	0.55				
H_2O+				2.76	0.82					
MnO					0.08	0.03	0.25			
Total	100.066	100.062	99.79	99.80	99.88	100.62	97.718			

Serial	211	212	213	214	215	216	217	218	219	220
Chem.	72	72	72	72	72	72	72	72	72	72
Col.	34	34	34	34	34	34	34	34	34	34
Pub.										
SiO_2	78.8	66.5	39.5	75.6	76.0	65.5	39.3	34.0	76.7	92.0
Cu	0.46	0.81	0.05	0.54	0.1	0.02	12.93	23.0	0.0	0.0
CO_2	tr	tr	20.60	0.00	0.94	9.90	3.80	4.5	4.5	0.0
Serial	221	222	223	224	225					
Chem.	72	72	72	72	72					
Col.	34	34	34	34	34					
Pub.										
SiO_2	36.0	44.8	56.7	79.6	59.5					
Cu	0.46	0.81	0.05	0.54	0.1	0.02	12.93	23.0	0.0	0.0
CO_2	18.0	0.40	0.0	1.7	tr					

Serial	226	227	228	229	230	231	232	233	234	235
Chem.	72	72	72	22	72		72	45	57	57
Col.	34	34	34	42	55		55			
SiO_2	84.80	55.80	84.04	66.60	62.72	56	66.91	55.50	63.61	62.50
Al_2O_3	7.18	40.90	6.84	2.00	2.86	3.22		19.25 1.16	16.89	20.10
Fe_2O_3	1.62		1.65					7.65	8.63	6.40
MgO					0.38	0.29	0.86	0.60	1.24	0.34
CaO	0.60			17.20	16.77	14.38	10.08	5.60	2.34	0.89
H_2O-	0.70	0.39	0.50	+	+	+	+	+		
H_2O+			3.48	14.20	14.25	12.51	8.26	10.80		6.10+
CO_2	0.60	tr	tr						3.19	1.07
SO_3							12.79	tr	0.50	
CuO	1.87	0.00	0.45							
MnO_2		tr	0.118							
Alkalis								0.96	1.08	
Total	97.37	97.09	97.078	100.00	96.98	99.96	100.06	100.36	97.48	97.40

Serial	236	237	238	239	240	241	242	243	244	245
Chem.	23	23	16	16	70	11	11	11		7
Pub.	47	47				47	47	7	12	
SiO_2	59.40	56.08	53.98	50.20	58.52	52.54	61.64	83.04	68.60	67.71
Al_2O_3	20.34	21.02	27.86	31.80	19.21	19.10	14.97	7.29	14.99	21.62
Fe_2O_3	6.78	9.86			8.29	5.30	2.88	2.79	4.91	3.12
MgO	0.81	1.62	1.98	1.80	1.92			tr	1.63	1.87
CaO	0.16	0.18	2.02	2.04	4.10	5.40	0.72	1.90	1.32	0.67
H_2O-			3.56	1.59						
CO_2	1.00	1.89				4.24	0.57			
LOI+			8.33	8.62	8.00	12.40	17.00	4.76	4.70	10.66
$(K.Na)_2O$										4.52

Serial	246	247	248	249	250	251	252	253	254	255
Chem.	72		63	63	63	63	63	72	73	73
Col.	75							64		
Pub.			9	9	9	9	7		36	36
SiO_2	58.57		42.56	40.84	43.06	42.50	42.30	51.18	67.43*	64.17
Al_2O_3	19.43		|	|	|	|	12.36	|	|	14.8
			| 17.20	| 18.84	| 18.24	| 18.50		| 18.30	| 16.95	
Fe_2O_3	5.13		|	|	|	|	5.92	|	|	8.1
MgO	1.58		6.22	5.22	6.60	6.14	5.50	4.78	2.59	2.00
CaO	1.71		12.58	13.80	10.70	11.36	12.86	6.13	1.03	1.34
Na_2O	0.63	0.18								
K_2O	4.05	3.82								
H_2O	1.91							2.26	3.40	6.54
H_2O	4.39						| †			
Org.							| 18.11			
CO_2	1.78						|	10.03	3.64	0.14
TiO_2	0.71									
P_2O_5	0.22							0.097		
SO_3	tr							0.00		3.70
MnO	0.026							0.34		
NaCl									4.99	
Total	100.136								100.03	100.79

*Ins. Sil Res.
†Loss on Ignition.

Serial	256	257	258	259	260	261	262	263	264	265
Chem.		72	72	72	72	72	72	72	1	1
Col.		22&66	43	35	21	21	21	21	3	3
Pub.									53	53
SiO_2		0.112			47.75	47.3	68.87			
CaO		32.075								
H_2O		21.08								
CO_2		0.009								
SO_3		45.80								
NaCl	99.15									
Cu			12.32	34.27	25.80	19.5	4.6	17.76	0.35	10.81

Serial	266	267	268	269	270	271	272	273	274	275
Chem.	44					62	62	62	62	62
Col.		50				54	54	54	54	54
Pub.	9		13	13	13	13	13	13	13	13
SiO_2	4.60									
Al_2O_3	8.75									
Fe_3O_4	52.05									
CaO	8.00									
H_2O	1.20									
P_2O_5	0.31									
Mn_3O_4	5.20									
LOI	+9.52									
Zn			47.0	58.0	38.5	0.17	0.77	0.55	0.45	0.77
Fe		7.0—35.0								

Serial	276	277	278	279	280	281	282	283	284	285
Chem.	73	72	72	85		72	72	29	59	72
Col.		10&74	10&74			53	63	63	28	74
Pub.	36			32			73		65	
SiO_2	13.58	53.02	53.03		3.16	0.075	45.13	45.20	36.99	0.43
Al_2O_3		11.74				0.000	0.88	0.86	5.36	
	3.27		8.04	0.60	2.84					0.27
Fe_2O_3		1.94				0.065	0.96	0.93	0.82	
FeO						0.040				
MgO	1.67	8.88	4.74	3.57	5.02	5.860	0.00	0.00	0.03	
CaO	26.91	7.71	5.27	51.48	51.42	49.190	0.00	0.00	0.51	
Na_2O							0.00	0.00		0.00
		1.47								
K_2O							0.00	0.00		
H_2O	15.38					0.050	0.31	0.36	0.27	0.29
CO_2	4.17	9.14	7.68	44.23	39.56	44.990		0.07		
TiO_2		0.56				0.000				
P_2O_5		0.17				0.006	tr	tr		
SO_3	34.15			0.12			17.87	18.14	19.20	0.31
MnO		0.095	0.06			tr	0.02	0.02		
BaO							34.25	34.50	35.76	
Res.								0.00	0.32	97.82
Total	99.13			100.00	102.00	100.276	99.42	100.08	99.26	99.12

NOTE: Res. in No. 263 is SrO; in 264 is organic; in 265 is NaCl; Br. and I, O. O.

Serial	286	287	288	289	290	291	292	293	294	295
Chem.	62	62	62	62	62					
Col.	54	54	54	54	54					
Pub.	13	13	13	13	13	13	13	13	13	48
Zn	5.4	25.46	8.88	8.08	45.96	19.0	56.0	60.0	59.0	57.507
Fe							2.0	1.0	1.0	2.335
Pb								0.0		0.939
Cu										0.044

*Insoluble Siliceous residue.
†Loss On Ignition.

Serial	296	297	298	299	300	301	302	303	304	305
Chem.	84							84	62	65
Pub.	30	13	13	13	13	13	13	30		
Zn.	58.260	50.0	45.0		20.6	45.56	53.0	58.260	33.24	22.0
Pb.	0.700			80.0				0.700	.256	
Fe	2.230	2.0	3.0			8.62	3.0	2.230		
S	30.42				10.1			30.42		

NOTE: Serial 296 has also the following: Cd, 0.304: Cu, 0.049; Mn, 0.010; SiO_2, 3.95; $BaSO_4$, 0.820; $CaCO_3$, 1.880; $MgCO_3$, 0.850.

Serial	306	307	308	309	310	311	312	313	314	315
Chem.	1								66	66
Col.	3								8	8
Pub.	53	13	13	13	13	13	13	13	37	37
Pb.	3.63	3.32	3.11	3.84	4.87	12.45	12.87	5.86		
Au								$0.85 per ton		
Mn									14.40	33.84
Fe									15.85	4.88
P									0.01	0.05
Sil. Res.									39.83	18.44

Serial	316	317	318	319	320	321	322	323	324	325
Chem.	66	66	66	66	66	66	66	66	66	66
Col.	8	8	8	8	8	8	8	8	8	8
Pub.	37		37	37	37	37		37	37	37
Mn	21.42	0.00	56.88	35.64	46.26	12.60	0.00	54.90	35.9	41.5
Fe	5.49	12.81	4.88	4.27	20.13	25.62	13.42	6.10		
P	0.054	0.03	0.14	0.00	0.25	0.30	0.00	0.29		
Sil. Res	22.71	55.44	13.09	15.02	2.03	8.72	77.04	1.91		

Serial	326	327	328	329	330	331	332	333	334	335
Chem.	66	66	66	42	42	42	42	42	42	67
Col.	8	8	8							
Pub.				37	37	37	37	37	37	9
Mn	32.4	30.61	28.9	39.66	39.67	43.18	38.54	40.50	35.78	27.25
Fe				6.00	6.15	5.72	6.76	8.50	8.09	
P				0.055	0.066	0.06	0.053	0.05		0.032
H_2O				4.05	4.75	3.25	4.05	3.70	5.00	

Serial	336	337	338	339	340	341	342	343	344	345
Chem.	67	67	67	67	67					
Pub.	9	9	9	9	9	9	9	9	9	9
Mn	4.42	24.71	25.48	25.99	28.68	51.78	59.55	40.28	43.18	49.34
Fe						2.46	3.07	4.92	1.23	1.84
P	0.119	0.066	0.053	0.061	0.047	0.053	0.026	0.046	0.036	0.053
SiO_2						0.30	0.75	0.85	1.30	2.00

Serial	346	347	348	349	350	351	352	353	354	355
Chem.							44	44	44	45
Pub.	9	9	9	9	9	9	9	9	9	9
SiO_2	0.60	1.40	0.35	0.83	0.73		1.60	1.28	3.60	15.90
Mn_3O_4	52.35§	42.95§	63.50§	46.05§	42.07§	42.17§	24.60	84.20	78.00	39.50§
Fe_2O_3	5.53"	5.95"	1.23"	2.46"	3.58"		15.40	2.86	2.85	6.83"
Al_2O_3							0.40	1.34	1.66	
CaO							24.20	2.20	5.00	
LOI†							32.08	5.48	7.60	
H_2O							1.08	0.80	1.00	
P_2O_5	0.056'	0.05'	0.023'	0.047'	0.033'	0.061'	0.30	0.38	0.34	0.19'
S				0.024	0.04					
Ag.									0.06	oz per ton

§Mn; "Fe; 'P. †LOI=Loss On Ignition.

Serial	356	357	358	359	360	361	362	363	364	365
Chem.	45	45	45	72	31	72	72	16	16	1
Col.				38		51				53
Pub.										
SiO_2	10.73	56.25	63.21	2.10						
Mn	46.71	9.83	7.05	49.20						
Fe	5.04	7.73	3.14	4.63						
P	0.14	0.24	0.08	0.057						
Au		0.00	0.00		0.02	0.00	0.00	1.98	0.59	0.00
Ag.	0.03	0.00	0.05		1.40	0.3	0.4	0.02	0.10	0.14

NOTE: Au and Ag are reported in Troy ounces per Avoirdupois ton.

$CaCO_3$	5.08
H_2O	4.97
Al_2O_3	2.24

Serial	366	367
Chem.	1	
Col.	3	
Pub.	53	13
Au.	0.00	0.85
Ag.	.92	0.00

NOTE: Au and Ag are reported in Troy ounces per Avoirdupois ton.

Serial	368
Chem.	72
Col.	4
Pub.	74
SiO_2	16.83
Al_2O_3	5.11
Fe_2O_3	3.23
FeO	tr
MgO	tr
CaO	39.76
Na_2O	0.43
K_2O	0.79
H_2O	0.66
H_2O++	2.90
Org.	
TiO_2	0.35
CO_2	3.07
P_2O_5	24.90
SO_3	tr
F	4.31
MnO	0.176
Total	102.516
−O=F	1.81

Serial	369	370	371	372	373	374	375
Chem.	60	68	68	68	60	68	68
Pub.	14	67	68	68	14	68	68
Asphalt	7.45	8.43	1.6	3.1	6.77	9.3	8.6

Serial	376	377	378	379	380	381	382
Chem.	68	68	68	60	68	68	66
Pub.	68	68	68	14&15	68	68	67
Asphalt	4.9	6.8	2.3	7.2	12.1	13.1	14.69

Serial	383	384	385	386	387	388	389
Chem.	68	68	68	68	68	68	68
Pub.	68	68	68	68	68	68	68
Asphalt	12.2	11.1	5.0	4.3	11.3	8.7	10.4

Serial	390	391	392	393	394	395	396
Pub.	68	68	68	68	68	68	68
Chem.	68	68	68	68	68	68	68
Asphalt	10.8	7.3	7.0	3.4	9.9	9.6	2.19

Serial	397	398	399	400	401	402	403
Chem.	68	68	68	60	72	72	68
Col.					13	13	
Pub	68	68	68	14&15			68
Asphalt	11.1	9.6	11.8	9.97	10.58	12.8	18.0

Total	100.706		Serial	404	405	406	407			
Corrected.			Chem.	68	66	66	66			
			Pub.	68	67	67	67			
			Asphalt	16.5	17.92	17.05	13.72			

Serial	408	409	410	411	412	413	414	415	416	
Pub.	52		68	62		62	62	62	62	
H_2O	0.09	0.25	0.7							
Vol. Bit.†	23.06	43.33								
Fixed C‡	75.90	54.97		48.5	52.76	55.00	34.4	43.5	38.42	
Ash.	0.95	1.45	5.7	6.7	0.21	0.70	14.55	0.3	7.10	
Sulphur	1.69	1.47		2.24						
Bitumen			94.1	90.50	99.50	99.50	81.85	95.7	83.7	

†Volatile bitumen. ‡Fixed carbon.

Serial	417	418	419	420	421	422	423	424	425	426
Chem.	54	54	54	54	54	54	54	54	54	54
Col.						53	53	53	53	53
Pub.	64	64	64	64	64	64	64	64	64	64
Gal. Oil										
Per Ton	22.0	28.5	tr	23.0	8.33	5.8	4.1	tr	0.0	6.6
Pct. Coke		65.5	53.5	38.4	88.00	92.5	92.2	90.5		

Serial	427	428	429	430	431	432	
Chem.	54	72	72	54	54	54	
Col.	53	46	46	59	54	54	
Pub.	64			64	64	64	
Gal. Oil							
Per Ton	0.0	5.5	10.4	0.248	38.3	17.9	
Pct. Coke					44.5	92.0	
Cu. Ft. Gas							
Per Ton		2500.00	600.0				

NOTE: Reported in gallons of oil per ton, cubic feet of gas per ton, and percent of coke. This refers to serials 417-432.

Serial	433	434	435	436	437	438	439	440
Chem.	72	72	72	9	9	79	66	9
Col.	59	59	59	62	62			62
Pub.				10	67			10
H_2O—, Moisture	8.65	12.64	11.35	0.05	5.40	8.27	1.74	0.05
V. C. M., Volatile	22.40	31.25	30.09	20.07	35.52	34.04	40.91	20.05
F. C., Fixed Carbon	15.04	35.34	40.58	78.63	49.19	51.04	49.84	78.60
Ash	53.91	20.77	17.98	1.25	989	6.65	7.51	1.30
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S	0.50	0.55	0.40		3.30	2.52		
B. T. U.	2,710.	7,550.	8,500.	13449	12256.	12575.		13442.

Serial	441	442	443	444	445	446	447	448	449	450
Chem.	9	9	79	79	9	9	9	79	79	
Col.	62	62	65	65	62	62	62	32	65	
Pub.			22	22				22	22	
H_2O—	3.14	2.04	6.06	6.71	5.00	5.22	5.28	1.55	6.29	6.46
V. C. M.	38.17	40.96	38.35	36.30	32.17	32.40	36.83	39.85	37.71	36.00
Fixed C.	48.72	53.15	47.39	48.26	52.01	46.18	45.43	49.45	47.80	46.58
Ash	9.97	3.85	8.20	8.73	10 82	16.20	12.46	9.15	8.20	10.96
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	4.72	2.66	3.84	6.02	4.57	4.02	3.70	3.78	3.76	2.12
B. T. U.	12538.	14255.	12737.	12568.	12572.	10752.	11891.	13674.	12694.	12186.

Serial	451	452	453	454	455	456	457	458	459	460
Chem.	79	79	79	9	9	28	9	78	30	9
Col.				62	62		62			62
Pub.	26	26	26							
H_2O				5.68	6.59	5.20	3.97	5.70	4.82	5.91
V. C. M.	34.74	37.15	36.00	30.86	33.17	32.60	33.38	32.65	27.93	36.99
Fixed C.	55.96	55.35	53.04	50.90	53.00	60.10	55.61	51.10	45.29	52.07
Ash	9.30	7.50	10.96	12.56	7.24	2.10	7.04	10.55	21.96	5.03
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.45	2.21	2.12	1.54	1.01	0.90	1.08	2.50	1.48	1.25
B. T. U.	12434	12738.	12186.	11809.	12875.	13216.	13302.	11620.		13478.

Serial	461	462	463	464	465	466	467	468	469	470
Chem.	9	9								
Col.	62	62	39	39	7	7				
H_2O	5.50	5.80	7.13	7.50	6.77	8.87	7.04	7.65	5.00	10.29
V. C. M.	35.61	32.82	33.59	32.89	36.25	34.82	34.55	33.96	36.51	31.46
Fixed C.	51.55	53.82	53.04	50.97	51.30	47.68	48.40	46.30	49.98	44.39
Ash	7.34	7.56	6.24	8.64	5.68	8.63	10.01	12.09	8.51	13.86
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.71	1.90	1.48	1.47	1.36	1.62	1.92	1.80	1.43	1.34
B. T. U.	12915.	12900.	12865.	12404.		12096.	12202.	11851.	12892	

Serial	471	472	473	474	475	476	477	478	479	480
Chem.	79	79	9		79		79	76	3	
Col.			62		65		65		49	
Pub.	26	26			22		22			
H_2O			4.02	4.14	4.14	4.23	4.23	6.26	1.40	9.39
V. C. M.	37.85	36.59	36.28	37.41	37.41	38.20	38.20	27.16	35.30	31.68
Fixed C.	54.47	53.61	50.28	48.28	48.28	47.75	47.75	64.74	61.20	54.31
Ash.	7.68	9.80	9.42	10.17	10.17	9.82	9.82	1.84	2.10	4.62
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.79	2.00	3.73	6.08	6.08	5.17	5.17	0.56		0.81
B. T. U.	12620.	12346.	12901.	12915.	12915.	12911.	12911.	13196.		12874.

Serial	481	482	483	484	485	486	487	488	489	490
Chem.	79	79	79	79	79	79				9
Col.	65	65	79	79	65	65	6	6	6	62
Pub.	22	22	23	23	22	22	21	21	21	
H_2O	9.39	5.75	5.30	3.86	4.09	4.89	5.18	4.39	4.83	2.07
V. C. M.	31.68	38.26	16.78	36.14	40.35	35.34	35.61	36.33	35.76	39.74
Fixed C.	54.31	45.92	72.47	46.34	45.48	48.04	55.22	55.35	55.55	49.63
Ash	4.62	10.07	5.45	13.66	10.08	11.73	3.99	3.93	3.86	8.56
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.81	6.02	1.72	6.53	6.55	5.76	1.14	1.57	1.34	2.21
B. T. U.	12874.	12568.	13984.	12316.	12910.	12481.			13829.	13263.

Serial	491	492	493	494	495	496	497	498	499	500
Chem.	9	9	79	79	79	79	79	79	79	79
Col.	62	62			31&60	31&60	31&60	23	23	23
Pub.			26	26	22	22	22	22	22	22
H_2O	1.82	1.95			12.08	8.49	10.20	3.66	3.88	5.49
V. C. M.	37.95	34.99	38.80	36.28	33.04	33.92	33.98	35.66	34.98	35.60
Fixed C.	54.77	57.41	51.95	54.99	52.07	54.65	52.93	54.10	55.48	52.74
Ash.	5.46	5.65	9.25	8.73	2.81	2.94	2.89	6.58	5.66	6.17
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.70	1.46	0.95	1.30	1.12	1.36	1.28	0.92	0.63	0.89
B. T. U.	14055.	13826.	13137.	13400.	12929.	13381.	13189.	1356.	13766.	13405.

Serial	501	502	503	504	505	506	507	508	509	510
Chem.	79	9	9	9	79	79	79	41		
Col.	23	62	62	62	70	70		71	29&76	29&76
Pub.	22				23	23	26	54	25	25
H_2O	4.33	1.85	1.18	3.60	3.15	3.00	3.33	1.04	3.53	3.48.
V. C. M.	35.51	15.86	16.32	15.13	17.27	19.19	16.33	37.96	34.01	34.86
Fixed C.	54.04	64.43	71.99	66.14	76.35	71.11	63.98	55.84	54.88	55.47
Ash.	6.12	17.86	10.51	15.13	3.23	6.70	19.69	5.16	7.56	6.19
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0 84	1.32	2.46	1.63	0.54	0.96	1.47	2.00	1.22	
B. T. U	13574.	11929.	13737.	12298.	14578.	13982.	11836.		13583.	

Serial	511	512	513	514	515	516	517	518	519	520
Chem.	77			79	79	79	79	79	79	79
Col.		65	39	44	44	44	44	44	15&68	15&68
Pub.	54	25	25	23	23	23	23	23	23	23
H_2O	0.22	3.17	2.37	11.20	2.90	3.70	2.90	4.20	2.55	2.40
V. C. M.	23.54	33.33	19.26	33.48	36.12	36.88	34.76	36.88	37.32	35.82
Fixed C.	66.16	58.94	69.54	46.62	55.64	53.83	53.41	53.46	53.60	51.68
Ash.	10.08	4.56	8.83	8.70	5.34	5.59	8.93	5.46	6.53	10.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	4.33			1.78	0.83	0.87	1.21	0.81	0.97	1.05
B. T. U.			13840.	11970.	13840.	13630.	13300.	13480.	13624.	13166.

Serial	521	522	523	524	525	526	527	528	529	530
Chem.	79	9	9	9	9	79	79	79	79	79
Col.	15&68	62	62	62	62	23, 36 44&60	23, 36 44&60	23, 36 44&60	23, 36 44&60	23, 36 44&60
Pub.	23					23	23	23	23	23
H_2O	4.75	2.87	4.32	3.20	3.00	3.84	3.46	4.40	4.08	3.92
V. C. M.	34.77	41.19	38.57	39.34	39.34	37.26	39.24	36.80	38.81	38.36
Fixed C.	51.43	50.92	49.81	55.97	52.10	52.36	50.41	51.36	51.32	52.44
Ash.	9.05	5.02	7.30	1.49	5.56	6.54	6.89	7.44	5.79	5.28
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.60	100.00
S.	0.98	2.27	1.39		1.14	1.39	0.86	1.28	1.91	1.14
B. T. U.	12968.	13812.	13353.	13929.	13972.	13415.	13304.	13172.	13484.	13552.

Serial	531	532	533	534	535	536	537	538	539	540
Chem.	79	79	79	9	9	9	37	37	79	79
Col.	23, 36 44&60	23, 36 44&60	23, 36 44&60	62	62	62			36&44	36&44
Pub.	23	23	23						23	23
H_2O	4.09	3.97	3.89	2.60	1.68	3.42	3.32	3.21	4.87	5.33
Fixed C.	50.76	50.65	51.41	53.58	55.65	57.27	55.43	52.10	52.79	52.31
V. C. M.	38.64	37.71	38.14	37.36	38.05	37.41	37.20	40.28	36.19	37.09
Ash	6.51	7.67	6.56	6.46	4.62	1.90	4.05	4.41	6.15	5.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.20	1.02	1.44	0.70	1.21	0.80	1.47	1.23	1.97	2.40
B. T. U.	13408.	13160.	13356.	13707	14547.	14441.	13931.	13989.	13291.	13.266.

Serial	541	542	543	544	545	546	547	548	549	550
Chem.	79									
Col.	36&44	29	29	29						
Pub.	23	41	41	41	41	41	41	41	25	25
H_2O	5.06	1.30	1.46	4.45	3.71	3.82	4.45	6.27	2.81	3.53
V. C. M.	36.66	38.90	39.04	36.15	36.21	37.45	38.18	32.37	36.11	36.34
Fixed C.	52.61	52.15	53.10	48.40	50.31	48.74	51.04	47.07	52.33	55.22
Ash.	5.67	7.65	6.40	11.00	9.77	9.99	6.33	14.29	8.75	4.91
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.22	1.58	1.38	1.52	1.39	1.47	1.43	1.79	1.82	1.52
B. T.U.	13266.		14040.	12607.	12907.			11837.	13320.	13885.

Serial	551	552	553	554	555	556	557	558	559	560
Chem.	9	79	79	79	9	9	9	9	9&69	9
Col.	62	6&27	6&27	6&27	62	62	62	62	62	62
Pub.		22	22	22						
H_2O	2.59	5.14	3.69	3.86	3.10	2.95	1.85	2.42	4.04	2.47
V. C. M.	40.25	37.59	38.03	37.84	37.91	35.85	39.01	40.06	39.44	37.79
Fixed C.	51.99	51.20	50.90	52.08	52.43	47.06	49.61	51.16	50.64	56.24
Ash.	5.17	6.07	7.38	6.22	6.56	14.14	9.53	6.36	5.88	3.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S	2.14	1.98	2.63	1.66	1.64	2.60	3.08	3.14	3.20	0.95
B. T. U	13823	13320.	13295.	13496.	13690.	12049.	13145.	13764.	13350.	14190.

Serial	561	562	563	564	565	566	567	568	569	570
Chem.	41	77	77			79	79	79	79	79
Col.	71				61	44	44	44	44	
Pub.	51	54			25	23	23	23	23	26
H_2O	1.68	0.48	0.45	0.41	5.09	3.50	3.80	2.50	3.05	
V. C. M.	41.00	22.03	20.89	18.23	15.79	18.53	18.66	19.11	18.64	18.97
Fixed C.	51.91	71.28	68.86	77.59	72.52	69.96	70.23	71.66	64.54	68.27
Ash.	5.41	6.21	9.80	3.77	6.60	8.01	7.39	6.73	13.77	12.76
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.72	1.13	0.69	1.06	0.69	0.77	0.82	0.54	0.73	0.98
P.	0.012	0.012	0.063							
B. T. U.						13730.	13740.	14040.	12703.	12851.

Serial	571	572	573	574	575	576	577	578	579	580
Chem.	66			9	9	9		9	9	9
Col	39	61	62	62	62	62	61	62	62	62
Pub.	67	25	25				25			
H_2O	0.64	3.13	4.03	2.92	1.57	1.62	3.90	1.42	1.52	1.01
V. C. M.	19.78	31.72	28.97	32.45	32.79	33.14	34.76	38.37	32.76	39.58
Fixed C	69.38	58.89	63.45	61.16	61.05	60.22	54.74	51.75	61.20	53.89
Ash.	10.20	6.26	3.55	3.47	4.59	5.02	6.60	8.46	4.52	5.52
Total	100.00	100.00m	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.05	0.86	1.05	0.90	0.63	1.80	2.27	2.45	1.30	1.44
B. T. U.		14022.	14312.	14389.	13884.	14327.		13449.	14389	14058.

Serial	581	582	583	584	585	586	587	588	589	590
Chem.	9	9								9
Col.	62	62	61	81	81	81	81	81	81	62
Pub.			25	21	21	21	21	21	21	
H_2O	2.55	3.61	4.59	2.44	2.57	3.21	2.81	2.92	2.70	2.11
V. C. M.	39.37	20.02	32.44	20.77	20.29	21.78	20.79	21.44	21.07	22.66
Fixed C.	51.07	67.05	58.21	69.84	71.21	68.84	70.65	68.80	69.88	67.95
Ash.	7.01	9.32	4.76	6.95	5.93	6.17	5.75	6.84	6.35	7.24
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.58	0.95	1.24	1.15	0.83	0.59	0.56	0.76	0.77	1.16
B. T. U.	13506.	13300.							14098.	14026.

Serial	591	592	593	594	595	596	597	598	599	600
Chem.	79	79	79	79	79	79	79	79	79	79
Col.	44	44	44	44	44	44	44	44	44	44
Pub.	23	23	23	23	23	23	23	23	23	23
H_2O	3.00	3.20	2.40	2.90	3.57	3.44	3.61	2.28	3.71	3.02
V. C. M.	22.70	22.36	22.55	22.62	22.53	21.38	21.78	22.82	22.57	22.75
Fixed C.	67.02	67.76	67.53	67.10	66.04	68.58	67.29	68.00	68.72	68.22
Ash.	7.28	6.68	7.52	7.38	7.86	6.60	7.32	6.90	5.00	6.00
Total	100.00	100.00	100.00	100 00	100.00	100.00	100.00	100.00	100.00	99.99
S.	0.78	0.68	0.78	0.83	0.73	1.01	0.86	0.91	1.04	0.99
B. T. U.	13790.	13960.	13970.	13950.	13774.	14042.	13871.	14042	14227.	14148.

Serial	601	602	603	604	605	606	607	608	609	610
Chem.	79	79	79	79	79	79	77	77	77	
Col.	44	44	44	44	15&68	15&68				
Pub.	23	23	23	23	23	23	54	54	54	25
H_2O	2.50	3.20	2.60	2.90	1.63	4.00	0.24	0.17	0.17	5.11
V. C. M.	23.50	22.65	23.57	22.92	21.94	20.74	15.13	16.53	15.51	13.65
Fixed C.	66.49	66.21	67.40	67.77	60.74	58.03m	80.00	78.27	71.01	73.21
Ash.	7.51	7.94	6.43	6.41	15.69	17.23	4.63	5.03	13.31	8.03
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.73	0.92	0.78	0.83	0.73	0.77	1.22	0.88	1.20	1.18
B. T. U.	13910.	13810.	14080.	14000.	12690.	12077.				13662.

Serial	611	612	613	614	615	616	617	618	619	620
Chem.	9		9	9	9	79	79	79	79	79
Col.	62		62	62	62	23	23	23	23	23
Pub.						22	22	22	22	22
H_2O	0.94	0.64	2.45	2.25	2.07	3.74	3.66	3.39	3.10	3.49
V. C. M.	15.88	14.29	37.92	38.01	39.74	37.58	37.81	38.84	38.36	37.94
Fixed C.	73.93	76.66	53.72	49.66	49.63	53.73	53.60	51.86	48.42	52.18
Ash.	9.25	8.41	5.91	10.08	8.56	4.95	4.93	5.91	10.12	6.39
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.46	1.24	0.90	2.27	2.31	0.67	0.78	0.84	2.13	1.70
B. T. U.	13875.	12057.	13932.	13112	13263.	13808.	13815.	13694.	12985	13640.

Serial	621	622	623	624	625	626	627	628	629	630
Chem.	79	9	9	79	79	79	79	79	79	79
Col.	23	62	62	44	44	44	15&68	36&44	36&44	36&44
Pub.	22			23	23	23	23	23	23	23
H_2O	3.53	1.52	1.01	6.00	3.90	4.20	2.38	3.14	3.36	2.84
V. C. M.	38.20	32.76	34.57	31.02	32.10	31.81	32.46	37.50	37.26	39.70
Fixed C.	51.74	61.20	59.41	58.66	59.77	59.97	58.13	50.26	50.76	49.94
Ash.	6.53	4.52	5.01	4.32	4.23	4.02	7.03	9.10	8.62	7.52
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.22	1.30	1.43	1.13	1.25	1.01	1.16	1.57	1.84	1.67
B. T. U.	13559.	14389.	14418.	13680.	13940.	14110.	13803.	13028.	13214.	13444.

Serial	631	632	633	634	635	636	637	638	639	640
Chem.	79	79	79			9	9	9	9	77
Col.	36&44	36&44	36&44	73		62	62	62	62	
Pub.	23	23	23	25	25					54
H_2O	5.84	2.88	3.77	2.63	3.42	1.80	2.92	2.60	2.80	1.49
V. C. M.	36.80	38.88	38.00	33.47	37.81	37.30	32.45	37.74	36.51	37.83
Fixed C.	51 38	51.97	50.61	54.53	53.33	57.90	61.16	51.85	53.96	53.06
Ash.	5.98	6.27	7.62	9.37	5.44	3.00	3.47	7.81	6.73	7.62
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.60	1.53	1.71	1.35	1.84	0.96	0.90	1.22	1.38	1.01
B. T. U.	13156.	13576.	13284.	12978.		13605.	14389.	13322.	13826.	13933.

Serial	641	642	643	644	645	646	647	6488	649	650
Chem.	9	79	79	79	79	79	79	79	79	79
Col.	62	44	44	44	15&68	15&68	15&68	23&40	23&40	23&40
Pub.		23	23	23	23	23	23	22	22	22
H_2O	1.87	1.80	1.90	1.90	1.70	1.95	1.95	2.18	2.38	2.69
V. C. M.	35.30	16.50	17.27	16.87	17.35	15.49	16.82	16.09	16.79	16.51
Fixed C.	55.29	73.94	73.08	73.97	71.76	59.13	68.24	71.44	72.94	73.15
Ash.	7.54	7.76	7.75	7.26	9.19	23.43	12.99	10.29	7.89	7.65
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.20	0.54	0.59	0.64	0.59	0.81	0.62	1.34	0.86	0.73
B. T. U.	13734.	14040.	14010.	14100.	13816.	11251.	13109.	13639.	13939.	13934.

Serial	651	652	653	654	655	656	657	658	659	660
Chem.	79	79	79	79	79	79	79	9	9	
Col.	23&40	23&40	23&40	24&60	36&44	36&44	36&44	62	62	
Pub.	22	22	22	23	23	23	23			25
H_2O	2.64	3.09	2.63	5.32	4.96	5.04	4.94	1.30	1.51	2.81
V. C. M.	16.26	16.28	16.48	32.90	36.31	35.35	36.05	38.10	37.84	36.54
Fixed C.	74.03	70.41	72.22	57.25	51.61	50.57	50.96	56.90	55.42	55.45
Ash.	7.07	10.22	8.67	4.53	7.12	9.04	8.05	3.70	5.23	5.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.93	1.11	1.00	1.59	1.65	1.87	1.75	0.57	0.82	0.85
B. T. U.	14081.	13437.	13799.	13586.	12911.	12681.	12820.	13371.	14141	

Serial	661	662	663	664	665	666	667	668	669	670
Chem.	9	9	77	9	9	9	9		79	79
Col.	62	62		62	62	62	62		15, 24,60	15, 24, 60
Pub.			54					25	23	23
H_2O	2.32	1.82	1.43	1.93	2.28	2.64	2.30	2.96	4.11	3.54
V. C. M.	38.06	38.48	38.15	38.65	38.61	35.25	37.69	35.97	37.15	37.73
Fixed C.	54.58	53.78	50.76	55.20	53.89	56.06	54.43	55.95	53.34	53.74
Ash.	5.04	5.92	9.66	4.22	5.22	6.05	5.48	5.12	5.40	4.99
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.49	0.87	1.30	0.96	1.03	1.21	1.01	1.05	0.92	0.85
B. T. U.	14049.	13996.		14218.	14009.	13804.	13959.	13707.	13549.	13741.

Serial	671	672	673	674	675	676	677	678	679	680
Chem.	79	79	79	79	79	79	79	79	79	9
Col.	15, 24 60	15, 24 60	15, 24 60	15&68	15&68	15&68	15&68	15&68	15&68	62
Pub.	23	23	23	23	23	23	23	23	23	
H_2O	3.35	3.67	3.68	3.40	3.60	3.10	3.90	3.20	2.38	2.17
V. C. M.	37.09	37.86	37.41	35.84	37.98	37.69	36.90	37.66	37.58	37.95
Fixed C.	54.57	53.98	53.85	54.77	52.73	53.78	52.76	54.49	51.57	55.90
Ash	4.99	4.49	5.06	5.99	5.69	5.43	6.44	4.65	8.47	3.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.16	0.86	0.96	1.01	0.82	0.82	1.15	0.87	0.91	1.02
B. T. U	13768.	13748.	13687.	13490.	13470.	13560.	13290.	13610.	13159.	14691.

Serial	681	682	683	684	685	686	687	688	689	690
Chem.	25	9								
Col.		62	67	67	67	67	67	67	67	67
Pub.			21	21	21	21	21	21	21	21
H_2O	2.35	1.71	2.81	3.17	3.25	2.97	3.07	3.19	3.57	3.22
V. C. M.	32.42	37.46	36.37	35.28	34.55	35.78	35.26	32.71	33.38	34.84
Fixed C.	60.91	56.35	56.35	57.39	57.59	56.82	57.30	57.06	58.05	57.21
Ash.	4.32	4.48	4.47	4.16	4.61	4.43	4.37	7.04	5.00	4.73
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.42	0.88	0.75	0.58	0.59	0.64	0.62	0.50	0.49	0.48
B. T. U.	13500.	14324.					13972.	13475.	13741	13873.

Serial	691	692	693	694	695	696	697	698	699	700
Chem.			66	79	79	79	79	79	79	79
Col.	6&69	6&69		36&44	36&44	36&44	36&44	36&44	36&44	36&44
Pub.	21	21	67	23	23	23	23	23	23	23
H_2O-	2.84	3.21	1.33	2.92	2.59	2.92	2.70	2.79	2.70	2.90
V. C. M.	35.71	35.65	36.97	37.53	38.28	37.42	39.52	39.81	38.87	37.77
Fixed C.	55.93	56.50	47.92	54.32	54.59	52.63	53.44	53.08	54.24	54.47
Ash.	5.52	4.64	13.78	5.23	4.54	7.03	4.34	4.32	4.19	4.86
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.61	0.67		0.53	0.80	0.57	0.88	0.65	0.57	0.94
B. T. U.	13777.	13849.		13761.	13943.	13462.	13964.	13968	13999	13882.

Serial	701	702	703	704	705	706	707	708	709	710
Chem.	79	79	79	79	79	9	9			
Col.	36&44	36&44	36&44	36&44	36&44	62	62		67	67
Pub.	23	23	23	23	23				21	21
H_2O-	2.73	2.86	3.26	2.57	2.76	3.56	2.83	1.00	3.28	3.99
V. C. M.	38.20	37.24	37.48	38.27	37.79	36.22	34.14	35.00	33.79	31.01
Fixed C.	54.15	54.64	55.02	54.62	54.62	53.41	56.10	58.00	57.75	59.51
Ash.	4.92	5.26	4.24	4.54	4.83	6.81	6.93	6.00	5.18	5.49
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.71	0.57	0.51	0.52	0.52	1.97	0.70		0.54	0.56
B. T. U.	13867.	13786.	13871.	13918.	13844.	13053.	13770.	13960.	13637.	

Serial	711	712	713	714	715	716	717	718	719	720
Chem.						25		79	79	79
Col.	67	67	67	67	67		73	44	44	44
Pub.	21	21	21	21	21		25	23	23	23
H_2O-	3.56	3.29	3.13	3.17	3.58	2.54	2.09	3.10	2.80	2.90
V. C. M.	32.94	32.88	32.52	32.31	32.11	30.90	27.59	32.56	34.70	34.08
Fixed C.	57.93	58.59	59.69	59.41	59.04	63.00	50.25	56.68	57.35	57.49
Ash.	5.57	5.24	4.66	5.11	5.27	3.56	20.07	7.66	5.15	5.53
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.55	0.58	.52	0.61	0.56	0.60	5.73	0.39	0.39	0.53
B. T. U					13615.	13664.	11695	13130.	13680.	13630.

Serial	721	722	723	724	725	726	727	728	729	730
Chem.	79	79	79	79			83	9	26	9
Col.	15&68	15&68	15&68	15&68	65			62		62
Pub.	23	23	23	23	25	41				
H_2O	2.80	2.65	2.85	4.00	3.46	8.03	0.00	4.92	2.15	5.96
V. C. M.	34.26	33.73	32.79	30.96	40.10	31.28	40.74	37.76	42.10	36.03
Fixed C.	57.89	54.18	52.56	46.85	47.09	41.40	52.66	46.54	41.68	47.53
Ash	5.05	9.44	11.80	18.19	9.35	19.29	6.60	10.78	14.07	10.48
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.52	0.49	0.56	0.80	3.54	3.20	2.25	4.60	3.50	3.09
B. T. U.	13734.	13098.	12644.	11299.			14196.	11793.	12997.	11849.

Serial	731	732	733	734	735	736	737	738	739	740
Chem.	9	9	9						9	
Col.	62	62	62	65	73	73	6&69	6&69	62	65
Pub.				25	25	25	21	21		25
H_2O	5.42	4.97	4.66	3.61	3.10	3.73	3.51	3.57	2.44	4.07
V. C. M.	36.47	36.54	38.25	35.56	32.07	31.97	36.23	36.06	37.73	36.11
Fixed C.	51.13	45.79	47.25	57.40	59.34	59.38	55.09	55.15	51.92	55.89
Ash.	6.98	12.70	9.84	3.43	5.49	4.92	5.17	5.22	7.91	3.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.95	3.13	3.31	0.81	0.89	0.72	0.82	0.86	0.38	0.52
B. T. U.	12557.	12294.	12732.		13495.	13316.	13556.	13565.	13529.	13573.

Serial	741	742	743	744	745	746	747	748	749	750
Chem.	9	9	66	66	66	55	9	9		66
Col.	62	62					62	62	61	
Pub.			67	67	67	42			25	67
H_2O—	2.99	2.64	1.59	1.52	1.84	1.792	3.55	3.88	2.54	2.84
V. C. M.	35.72	36.02	37.60	40.56	37.98	40.207	35.85	38.20	31.58	32.38
Fixed C.	57.49	55.92	57.23	54.61	57.87	53.118	57.53	53.57	54.15	46.73
Ash.	3.80	5.42	3.58	3.31	2.31	4.883	3.07	4.35	11.73	18.05
Total	100.00	100.00	100.00	100.00	100.00	100.000	100.00	100.00	100.00	100.00
S.	1.37	1.20	.64	0.72	0.62	1.333	1.10	1.21	3.16	
B. T. U.	13905.	1307.					13788.	13656.		

Serial	751	752	753	754	755	756	757	758	759	760
Chem.	41&77		9	9	9	9	9	9	9	9
Col.	71		62	62	62	62	62	62	62	62
Pub.	51	42								
H_2O	1.74	1.804	2.50	3.55	2.10	1.98	1.60	1.70	1.91	7.05
V. C. M.	37.00	37.171	35.82	34.92	32.20	36.06	33.40	35.80	36.40	14.50
Fixed C.	56.86	54.300	54.89	56.78	61.10	56.44	61.00	57.80	55.58	36.02
Ash.	4.40	6.725	6.79	4.75	4.60	5.52	4.00	4.70	6.11	42.43
Total	100.00	100.000	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.65	0.896	1.39	1.25	0.63	1.07	0.63	0.57	0.95	5.77
B. T. U.	13223.		13687.	13865.	13527.	14173.	13603.	13371.	14043	7610.

Serial	761	762	763	764	765	766	767	768	769	770
Chem.	79	79	79	79	79	79	79	41&77		
Col.	44	44	44	15&68	15&68	15&68	15&68	71		
Pub.	23	23	23	23	23	23	23	51	42	31
H_2O -	2.60	3.40	2.80	2.55	2.55	2.50	2.65	3.56	4.323	4.61
V. C. M.	35.45	34.97	35.67	35.81	34.59	34.52	34.36	41.61	40.507	39.16
Fixed C.	56.30	55.06	55.99	57.01	56.33	53.91	53.64	41.12	47.070	45.74
Ash.	5.65	6.57	5.54	4.63	6.53	9.07	9.35	13.71	8.100	10.49
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.000	100.00
S.	0.54	0.53	0.44	0.42	0.42	0.47	0.56	4.56	12.598	0.37
B. T. U.	13660.	13310.	13590.	13784.	13497.	13114.	12962.	13256.		

Serial	771	772	773	774	775	776	777	778	779	780
Chem.							9	83		
Col.	29	29					62		29	29
Pub.	25	25	25	25	41	41			41	41
H_2O -	5.29	6.50	6.24	8.35	6.24	9.00	5.65	3.32	8.29	16.95
V. C. M.	37.54	39.01	37.26	35.50	35.44	33.96	38.55	41.09	30.61	33.30
Fixed C.	45.04	45.18	43.29	43.58	45.33	40.68	54.90	46.48	36.05	41.61
Ash.	12.13	9.31	13.21	12.57	12.99	16.36	10.90	9.11	25.05	8.14
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	3.77	3.67	3.96	3.79	3.86	4.12	4.42	3.12	3.95	2.90
B. T. U.		11842.	11228.		11275.		11768.	13017.	9110.	

Serial	781	782	783	784	785	786	787	788	789	790
Chem.			9	9		79	79	79	79	79
Col.			62	62	39	36&44	36&44	36&44	36&44	36&44
Pub.	41	41			25	23	23	23	23	23
H_2O-	16.51	19.71	5.54	5.60	7.07	6 61	6.98	7.74	6.57	6.17
V. C. M.			38.12	41.51	36.41	38.21	38.31	38.53	39.75	39.26
Fixed C.			45.18	42.05	45.68	42.54	42.35	42.20	42.03	42.67
Ash.	7.72	41.99	11.16	10.84	10.84	12.64	12.36	11.53	11.65	11.90
Total			100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	2.81	5.03	4.76	3.30	3.64	4.15	3.71	5.16	3.68	4.54
B. T. U.			11726.	12409.	11468.	11171.	11212.	11131.	11284.	11333.

Serial	791	792	793	794	795	796	797	798	799	800
Chem.	79	79	79	79	79	79	79		82	82
Col.	36&44	36&44	36&44	36&44	36&44	36&44	36&44			
Pub.	23	23	23	23	23	23	23	31		
H_2O-	6.59	6.31	7.12	7.06	6.09	7.07	6.89	2.10	0.00	0.00
V. C. M.	38.62	38.29	40.38	39.72	40.28	40.64	39.36	29.71	35.31	35.37
Fixed C.	42.87	43.14	42.28	42.41	40.63	41.68	42.30	62.67	58.49	54.42
Ash.	11.92	12.26	10.22	10.81	13.00	10.61	11.45	5.52	6.20	10.21
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	4.27	4.27	3.46	3.66	4.75	3.42	3.93		0.96	1.47
B. T. U.	11264.	11315.	11416.	11371.	11227.	11378.	11340.		13637.	13449.

Serial	801	802	803	804	805	806	807	808	809	810
Chem.	82	82	82			72		9	41&77	9
Col.							61	62	71	62
Pub.				61	61		25		51	
H_2O-	0.00	0.00	0.00	1.04	2.90	0.48	3.39	2.52	2.08	3.72
V. C. M	34.50	36.87	36.03	36.75	36.79	24.13	34.38	35.24	37.52	34.86
Fixed C	52.34	58.81	56.65	57.80	56.41	69.50	57 33	56.16	56.02	52.53
Ash.	13.16	4.32	7.32	4.41	3.90	5.89	4.90	6.08	4.38	8.89
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.50	1.40	1.78			1.00	0.82	1.61	0.90	0.96
B. T. U.	14000.	13090.	13239.				13748.	13693	14226.	13244.

Serial	811	812	813	814	815	816	817	818	319	320
Chem.		9	9	55	9	9	9	9	79	79
Col.		62	62		62	62	62	62	36&44	36&44
Pub.	42			42					23	23
H_2O	1.709	4.68	6.30	1.058	3.23	3.33	3.72	5.22	6.13	5.81
V. C. M.	38.668	37.73	36.66	19.032	35.86	34.47	34.86	b37.39	39.95	40.05
Fixed C.	52.488	42.20	41.03	72.385	57.86	53.75	52.53	47.13	45.15	45.70
Ash.	7.135	15.39	16.01	7.525	3.05	8.45	8.89	10.26	8.77	8.44
Total	100.000	100.00	100.00	100.000	100.00	100.00	100.00	100.00	100.00	100.00
S.	1.006	8.27	6.42	0.649	1.21	0.88	0.96	4.64	3.32	3.76
B. T. U.		10502.	10500.		14343.	13297.	13244.	11896.	11975.	12074.

Serial	821	822	823	824	825	826	827	828	829	830
Chem.	79	79	79	79						
Col.	36&44	36&44	36&44	36&44	29	29	29	29	29	29
Pub.	23	23	23	23	25	25	25	41	41	41
H_2O-	5.58	5.69	5.88	5.94	2.97	2.93	4.61	4.16	5.93	4.79
V. C. M.	39.87	40.30	39.06	39.46	40.43	39.02	37.00	36.66	38.05	37.30
Fixed C.	45.45	46.46	45.23	45.79	48.22	47.75	47.25	49.43	48.53	47.58
Ash	9.10	7.55	9.83	8.81	8.38	10.30	11.14	9.75	7.49	10.33
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	9.10	7.55	9.83	8.81	3.05	3.73	3.63	3.16	3.20	3.93
B. T. U.	11995.	12215.	11768.	12019.		12591.	12319.			12379.

Serial	831	832	833	834	835	836	837	838	839	840
Chem.	66		9	9	9	9	9	9	9	9
Col.		39	62	62	62	62	62	62	62	62
Pub.	67	25								
H_2O-	1.65	4.54	5.03	4.80	4.95	2.56	2.12	5.46	2.01	2.19
V. C. M.	42.35	37.50	34.18	33.91	35.01	37.69	39.37	34.69	37.91	40.35
Fixed C.	49.10	49.40	55.40	58.87	51.66	51.64	51.56	53.78	51.54	51.50
Ash.	6.90	8.56	5.39	2.42	8.38	8.11	6.95	6.37	8.54	5.96
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.		3.23	1.52	1.40	1.42	2.78	1.09	1.64	2.32	3.27
B. T. U.		12710.	13032.	13169.	12648.	13077.	13781.	13162.	13361.	13529.

Serial	841	842	843	844	845	846	847	848	849	850
Chem.	9	55	66				55	55	72	79
Col.	62			65	65	65			16	60
Pub.			67	25	25	25				22
H_2O-	2.93	1.60	2.23	4.86	5.14	3.77	1.25	1.66	1.96	1.46
V. C. M.	40.95	24.83	37.94	35.59	34.02	37.44	22.49	23.01	25.89	27.56
Fixed C.	49.68	70.62	51.70	54.43	55.23	53.79	68.38	73.41	69.13	67.04
Ash.	6.44	2.95	8.13	5.12	5.61	5.00	7.88	1.92	3.02	3.94
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.		1.90		1.49	1.23	2.24	6.18	0.91	0.55	0.63
B. T. U.	14000.	13209.			13023.	13786.	12960.	13298	14950.	14711.

Serial	851	852	853	854	855	856	857	858	859	860
Chem.	79	79		79	79	79	9	32	25	9
Col.	79	60		79	60	79	62			62
Pub.	23	23		23	23	23				
H_2O-	3.75	3.07	0.60	3.04	5.52	3.88	2.55	1.78	6.30	0.82
V. C. M.	27.14	26.11	17.15	21.32	22.67	29.70	41.58	31.13	30.78	35.36
Fixed C.	66.59	66.27	76.20	69.58	64.17	63.90	45.88	57.42	60.81	47.47
Ash	2.52	4.55	6.05	6.06	7.64	2.52	9.99	9.67	2.11	16.35
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	0.63	0.69	0.85	3.83	3.40	1.38	3.52	1.03	0.87	7.03
B. T. U.	14641.	14350.	15424.	14281.	13325.	14531.	13162.	11820.	13246.	12146.

Serial	861	862	863	864	865	866	867	868	869	870
Chem.	9	9	9	25	77	77	52	79	79	79
Col.	62	62	62					44	44	44
Pub.					54	54		23	23	23
H_2O-	1.04	0.63	0.91	1.62	0.48	0.55	0.57	1.50	1.50	1.90
V. C. M.	36.10	29.65	33.95	32.97	23.82	23.02	26.39	22.56	21.77	21.58
Fixed C.	49.41	42.24	47.02	55.76	66.69	64.21	67.80	62.74	64.71	62.59
Ash.	13.45	27.48	18.12	9.65	9.01	12.22	5.24	13.20	12.02	13.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.	4.77	6.11	5.21		4.64	5.81	1.16	3.94	3.84	3.53
B. T. U.	13209.	10716.	12376.	13825.	12767.	12309.	13275.	13310.	13420.	13060.

Serial	871	872	873	874
Chem.	79	79	79	79
Col.	44	44	15&68	15&68
Pub.	23	23	23	23
H_2O-	1.90	1.50	0.65	0.78
V. C. M.	21.97	22.56	22.70	21.43
Fixed C.	62.59	62.25	65.67	60.64
Ash.	13.54	13.69	10.98	17.15
Total	100.00	100.00	100.00	100.00
S.	3.78	6.25	3.66	4.25
B. T. U.	13080.	13030.	13770.	12743.

Serial	875
Chem.	79
Col.	
Pub.	18
CH_4	89.1
C_2H_6	4.2
CO_2	2.8
N	3.9
He	
O	
Total	100.0
B. T. U. per cu. ft.	

Serial	876	877	878	879	880	881	882	883	884	885
Chem.	79	79	79	79	79	10&56	79	79	79	79
Pub.	19			45		38				19
CH_4	92.4	80.07	64.07	30.33	73.67	83.40	63.53	66.45	84.89	75.4
C_2H_6	3.1	11.31	22.36	26.69	16.44	10.31	21.67	18.97	9.30	17.7
CO_2	1.4	4.44	0.00	0.49	0.34		0.23	0.39	0.38	0.3
N	3.1	4.18	13.57	42.12	9.55	5.19	13.97	13.95	5.29	6.6
He	0.6			0.39		0.16				
O							0.59	0.26	0.13	
Olifines						0.61				
H						0.33				
Total	100.0	100.00	100.00	100.02	100.00	100.00	99.99	100.02	99.99	100.0
B. T. U	1042.	977.	1006.		974.	1018.	982.	968.	983.	1132.
Cu. ft.										
Sp. G.						0.624				0.67

Serial	886	887	888	889	890	891	892	893	894	895
Chem.	24&58	24&58	24&58	24&58	24&58	8	24&58	79	79	24
Col.						78				
Pub.						57				20
CH_4	69.16	67.19	59.52	66.97	58.52	77.10	0.00	76.86	76.14	54.00
C_2H_6	18.88	18.75	22.62	14.94	23.38		15.79	22.13	19.35	
C_3H_8							74.41			
C_5H_{12}										32.49
CO_2	0.38	0.52	0.25	0.38	0.65	18.70	0.86	0.32	0.64	0.44
N	11.31	13.54	17.09	17.45	16.96	3.70	7.09	0.64	3.88	9.73
O	0.26	0.00	0.51	0.25	0.51	0.50	1.85			3.34
Total	99.99	100.00	99.99	99.99	100.02	100.00	100.00	99.95	100.01	100.00
BTU per cu. ft.	995.	974.	966.	907.	970.		2105.	1124.	1073.	2356.
Sp. G.										1.28
Gasoline content in gals. per 1000 ft. og gas										5.3

Serial	896	897	898	899	900	901	902	903	904	905
Chem.	24	24	24	24	24	79	79	40	79	79
Col.									78	
Pub.	20	20	20	24	24			38	58	
CH_4	37.01	51.66	51.61	71.02	27.43	40.62	68.74	96.20	91.9	1.08
C_2H_6				25.54	71.39	33.42	20.44		4.1	95.36
C_5H_{12}	41.64	20.60	26.24							
CO_2	1.08	0.50	0.53	0.86	0.47	1.70	0.16	0.20	0.4	0.57
N	13.24	20.41	17.37			19.66	10.30	2.40	3.6	2.55
O	7.03	6.71	4.24			4.61	0.30	0.60		0.42
C_2H_4								0.20		
CO								0.40		
Total	100.00	99.88	99.99	100.00	100.00	100.01	99.94	100.00	100.0	99.98
BTU per cu. ft.	3337.	2145.	2112.	1130.	1490.	969.	1018.			
Sp. G	1.58	1.11	1.21							

Serial	906	907	908	909	910	911	912	913	914	915
Chem.	79			79	79	79	79	79	79	79
Pub.		35	35	18	19			60	60	
CH_4	26.79	49.1	60.7	73.5	69.4	3.27	67.48	75.1	80.2	27.79
C_2H_6	68.95	44.1	35.8	18.4	20.6	5.43	21.31	8.5	11.1	22.52
CO_2	1.37	6.1	2.9	0.0	0.1	0.44	0.41	0.2		0.36
N	2.50	0.7	0.6	8.1	9.9	90.84	9.84	16.2	8.7	48.32
O	0.44						0.95			
Total	100.05	100.0	100.0	100.0	100.0	99.97	99.99	100.0	100.0	99.99
BTU		1344.	1313.	1125.	1122.	132.	1114.	958.	1061.	657.
cu. ft.										
Sp. G.		0.83	0.76	0.68	0.7			0.67	0.65	

Serial	916	917	918	919	920	921	922	923	924	925
Chem.	79	27		79	79	79	79	79	79	79
Pub.		45	19	45	45	19				
CH_4	69.63	57.89	92.1	76.60	58.60	95.2	66.54	71.00	29.54	66.98
C_2H_6	22.69	16.89	4.1	2.25	5.69	0.0	18.24	18.54	10.59	17.97
CO_2	0.49	0.24	0.4	0.25	0.86	1.3	0.49	0.16	0.19	0.11
N	7.05	24.97	3.4	20.78	34.85	3.5	14.35	9.82	48.40	14.94
O	0.12			0.12			0.36	0.61	11.09	
Total	99.98	99.99	100.0	100.00	100.00	100.0	99.98	100.13	99.81	100.0
BTU	1065.		1057.	778.	664.	1014	959	1007.	468.	1047.
cu. ft.										
Sp. G.			0.59			0.58				

Serial	926	927	928	929	930	931	932	933	934	935
Chem.	79	79	79	79	79	46	46	46		
Pub.						46	46	46	19	19
CH_4	69.50	70.66	68.23	77.42	78.10	93.2	40.7	11.9	88.6	66.5
C_2H_6	15.65	16.26	15.36	11.60	10.42	0.8	57.7	85.7	5.6	20.7
CO_2	0.12	0.13	0.27	0.35	0.24	4.0	0.3	0.5	1.4	0.3
N	14.34	12.53	15.99	10.50	11.00	2.0	1.1	1.6	4.4	12.5
O	0.38	0.40	0.55	0.14	0.24		0.2	0.3		
Total	99.99	99.98	100.40	100.01	100.00	100.0	100.0	100.0	100.0	100.0
BTU		965.	952.	949.	936.	1008.			1048.	1093.
cu. ft.										
Sp. G.						0.60			0.64	0.72

Serial	936	937	938	939	940	941	942	943	944	945
Chem.			79	79	79		79	79	79	79
Pub.	19	45				18				
CH_4	85.1	51.91		66.47	34.33	93.1	64.60	57.74	70.29	61.11
C_2H_6	8.8	1.12	45.53	23.97	57.34	5.7	25.09	20.12	16.08	16.47
C_3H_8			36.35							
CO_2	1.00	0.00	3.59	1.11	0.63	0.4	0.69	0.54	0.52	0.41
N	5.1	46.86	12.95	7.36	7.39	0.8	9.20	18.99	12.31	19.40
O	0.0	0.21	1.62	0.55	0.31		0.41	2.73	0.77	2.60
Total	100.0	100.10	100.04	99.46	100.00	100.0	99.99	100.12	99.97	99.99
BTU	1070.	520.	1679.	1062.	1319.	1098.	1058.	908.	958.	875.
cu. ft.										
Sp. G.	0.65					0.59				

Serial	946	947	948	949	950	951	952	953	954	955
Chem.	24	5	5	5	5	5	5	5	79	71
Col.										58
Pub.	27	27	27	27	27	27	27	27		45
CH_4	63.18	70.45	38.20	44.90	40.50	71.21	48.65	46.35	28.72	
C_2H_6	5.11	5.00	15.00	13.60	10.92	14.90	19.65	21.26n	45.80	
CO_2		0.60		0.13	0.22	0.76		0.36	2.22	
N		23.95	46.80	41.04	48.15	13.13	31.62	31.77	21.61	
O				0.33	0.21		0.08	0.26	1.66	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.01	
BTU per cu. ft.	700.	733.	649.	691.	600.	979.	836.	841.	1066.	
He										0.05

Serial	956	957	958	959	960	961	962	963	964	965
Chem.	10&56	71	71	10&56	71	71	71	71	71	71
Col.	11&45	19	19	11&45	19	19	19	19	19	19
Pub.	45	45	45	45	45	45	45	45	45	45
He	tr	0.39	0.10	0.16	0.20	0.17	0.14	0.22	0.17	0.27

Serial	966	967	968	969	970	971	972	973	974	975
Chem.				71	71					
Col.	77	77	77	58	58	77	77	77	77	77
Pub.	45	45	45	45	45	45	45	45	45	45
He	0.15	0.089	tr	tr	0.06	0.35	0.05	0.097	0.06	0.18

Serial	976	977	978	979	980	981	982	983	984	985
Chem.								71	71	71
Col.	77	77	77	77	77	77	77	58	58	58
Pub.	45	45	45	45	45	45	45	45	45	45
He	0.17	0.16	0.24	0.22	0.27	0.22	0.43	0.35	0.27	0.37

Serial	986	987	988	989	990	991	992	993	994	995
Chem.	71	71	71							
Col.	58	58	58	77	77	77	77	77	77	77
Pub.	45	45	45	45	45	45	45	45	45	45
He	0.003	0.15	0.06	0.71	0.65	0.62	0.58	0.62	0.48	0.53

Serial	996	997	998	999	1000	1001	1002
Chem.		71	71	71	71	71	71
Col.	77	58	58	58	58	19	19
Pub.	45	45	45	45	45	45	45
He	0.53	0.23	0.54	0.33	0.48	0.37	0.36

Serial	1003	1004	1005	1006	1007	1008	1009	1010
Chem	2	19	19	72	2	19	19	88
Col.		20	20	57		20	20	20
Pub.	1	35	35		1	35	35	75
Gas	0.0	10.0	15.0	0.0	0.1	5.5	1.5	19.23
Ker.	23.1	33.0	32.0	1.8	28.9	36.0	35.0	30.59
Res.	77.9	54.2	50.1	88.2	71.0	58.0	62.4	50.1
Asp.		0.55	4.01			0.15	0.76	
Par.		6.14	2.89			3.43	5.70	
Be'°.	32.49	36.4	36.4	18.0	35.4	34.1	33.2	35.0
S.					0.17			
H_2O					0.1			

Serial	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
Chem.	88	2	19	19	19	19	19	78	1	19
Col.			20	20	20	20	20			20
Pub.	75	1	35	35	35	35	35		1	35
Gas.	14.35	0.00	3.0	3.00	3.5	3.5	8.0	17.0	0.00	2.0
Ker.	29.13	28.10	39.0	43.5	42.0	44.0	37.0	19.1	34.00	37.5
Res.	56.52	71.90	58.7	54.0	51.5	52.4	54.5	63.9	66.00	60.6
Asp.			0.18	1.00	1.34	1.12	0.23			0.28
Par.			5.27	2.73	2.61	7.90	3.75			7.3
Be'°	31.50	32.71	33.10	34.30	34.6	33.8	34.3	35.5	35.58	32.3
S.		0.14						0.19	0.16	
H_2O								0.1		

Serial	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
Chem.	19	19	78	77	77	21	2	19	19	19
Col.	20	20						20	20	20
Pub.	35	35		44	44	44	1	35	35	35
Gas.	7.0	tr	18.9	8.8	7.7	13.7	0.0	13.5	6.0	14.0
Ker.	38.5	40.5	17.4	44.1	36.0	33.2	13.1	31.0	35.0	33.0
Res.	52.8	57.0	63.7	47.1§	56.3§	53.1§	86.9	54.8	54.6	51.2
Asp.	0.62	0.42						1.26	2.19	0.75
Par.	2.87	8.41						9.1	4.16	4.51
Be^{w}	34.8	33.5	38.10	37.0x	37.0	34.7	32.6	34.5	34.4	35.7
S.							0.11			

§Res. 275°C—

Serial	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040
Chem.	19	88	88	88	2	19	19	19	19	19
Col.	20					20	20	20	20	20
Pub.	35	75	75	75	1	35	35	35	35	35
Gas.	11.0	25.47	16.02	13.63	1.7	10.0	9.5	2.5	7.0	4.5
Ker.	36.0	32.62	29.67	34.04	33.1	37.5	35.0	40.0	46.0	37.0
Res.	51.1	41.91	54.31	52.33	65.2	53.2	55.4	55.4	56.4	55.9
Asp.	0.93					0.20	0.03	0.15	0.81	0.30
Par.	4.59					6.06	7.75	6.63	7.86	6.62
Be^{w}	35.9	37.0	31.5	30.0	36.94	35.0	34.4	33.9	34.4	34.4

Serial	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050
Chem.	19	19	19	19	19	19	19	19	19	19
Col.	20	20	20	20	20	20	82	82	82	82
Pub.	35	35	35	35	35	35	35	35	35	35
Gas.	5.0	7.5	10.0	1.0	15.5	tr	10.0	11.0	6.0	9.0
Ker.	44.0	44.5	43.5	41.0	36.0	39.5	38.5	35.0	39.5	45.0
Res.	48.8	48.5	47.4	56.9	49.4	60.7	51.1	50.1	50.5	44.2
Asp.	0.05	1.18	1.12	0.92	0.82	0.63	0.0	0.0	0.0	0.0
Par.	5.55	5.59	5.42	5.68	4.38	7.26	5.7	4.5	4.2	6.1
Be^{w}	35.4	36.6	36.9	32.7	35.5	31.5	37.4	36.5	40.9	40.9

Serial	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060
Chem.	19	19	2	51	51	51	51	51	51	51
Col.	82	82								
Pub.	35	35	1	29	29	29	29	29	29	29
Gas.	8.0	4.0	0.0	30.0§	27.0§	26.0§	17.0§	17.0§	17.0§	0.0§
Ker.	43.0	48.0	26.0	12.0§	11.0§	10.0§	12.0§	12.0§	16.0§	12.0§
Res.	47.5	47.8	74.0	40.0§	43.0§	41.0§	44.0§	49.0§	45.0§	60.0§
Par.	4.2	7.6								
S.			0.2							
Be'$_0$	40.8	40.2	33.1	39.0	38.0	36.0	33.0	33.0	33.0	27.0
Mineral	Seal Oil,	450$_0$F-590°F		18.0	19.0	23.0	27.0	22.0	22.0	28.0

Serial	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070
Chem.	2	2	2	53	53	53	53	19	19	19
Col.		5	5					20	20	20
Pub.	1	1	1	24	24	24	24	35	35	35
Gas.	3.3	1.4	3.4	31.0§	31.4§	32.0§	32.0§	16.5	9.0	3.0
Ker.	37.9	38.7	41.8	15.7§	14.2§	14.0§	12.6§	35.0	38.5	42.0
Res.	58.8	59.9	54.8	31.2§			31.2§	47.4	51.6	49.8
Asp.								1.69	1.74	0.26
Par.								4.18	8.23	4.45
S.	0.27	0.15	0.22							
H_2O		0.1	tr							
Be'$_0$	37.0	38.07	40.94	39.1	38.6	39.4	39.1	34.8	36.2	34.7

Serial	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080
Chem.	19	19	19	72	2	2	19	19	19	19
Col.	20	20	20	18			20	20	20	20
Pub.	35	35	35		1	1	35	35	35	35
Gas.	3.0	1.0	9.5			1.7	7.5	8.5	4.5	8.0
Ker.	42.0	32.0	28.0	5.0	25.2	30.4	42.0	42.0	46.0	44.5
Res.	55.7	63.3	58.5	95.0	74.8	67.9	50.00	49.9	49.9	48.0
Asp.	0.47	1.43	1.26				0.11	0.45	0.24	0.90
Par.	6.07	3.5	3.68				5.41	6.98	5.99	7.53
S.					0.26	.28				
H_2O						0.20				
Be'$_0$	32.7	29.6	32.7	20.0	32.14	35.83	36.5	36.5	35.4	35.9

§1054-1060, Gas-35°F; Ker., 350-450F; Res.,590°F-. §1064-1067, Gas+Naptha-200°C; Ker., 200-275°C; Res., 275°C-.

Serial	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090
Chem.	19	19	19	2	19	19	88	88	2	87
Col.	20	20	20		20	20				1
Pub.	35	35	35	1	35	35	75	75	1	59
Gas.	11.5	10.0	10.0	0.0	3.5	2.5	17.51	1.37	0.0	9.3
Ker.	43.5	41.0	42.5	29.8	46.5	40.	35.92	21.27	30.0	32.7
Res.	45.3	47.6	47.6	70.2	51.5	56.9	46.57	77.36	70.0	58.0
Asp.	0.35	0.21	0.51		1.30	0.31				
Par.	11.46	3.12	9.7		5.56	5.01				
S.				0.25			0.27	1.78	0.18	
Be%	38.0	37.2	36.2	32.89	35.1	33.7	35.5	19.5	35.92	30.3

Serial	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
Chem.	87	88	88	88	88	34	34	29	79	2
Col.	1									
Pub.	59	59	59	59	59	59	59	59	59	1
Gas.	16.7	12.0	11.7	12.9	11.6	14.5	10.3	15.0	7.0	0.0
Ker.	28.3	35.0	34.6	34.0	34.5	40.8	32.0	25.0	30.7	23.0
Res.	55.0	53.0	53.7	53.1	53.9	44.7	57.7	60.0	62.3	77.0
Asp.		0.71	0.7							
Par.		0.67	0.67							
S.		0.66	0.55	0.72	0.73				0.7	0.35
Be%	32.75	31.8	31.8			33.7	30.4	31.8	31.57	30.55

Serial	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
Chem.	72	2	2		19	3	2	19	19	19
Col.	47				56			20	20	20
Pub.		1	1		35		1	35	35	35
Gas.	0.0	0.0	2.20		22.0	9.00	0.0	3.0	10.0	13.0
Ker.	18.0	21.9	46.3		38.0	45.00	21.7	34.0	30.0	31.0
Res.	82.0	78.1	51.5		36.0	46.00	78.3	62.1	57.1	56.4
Asp.										0.10
Par.					7.0			11.9	9.45	6.75
S.		0.2	0.16							
H_2O		0.1								
Be%	19.3	33.09	34.64	51.5	47.5	32.0		35.5	37.0	36.6

Serial	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
Chem.	19	2	2	19	19	19	19	19	19	19
Col.	20			20	20	20	20	20	20	20
Pub.	35	1	1	35	35	35	35	35	35	35
Gas.	0.0	0.2	0.1	11.0	11.0	12.0	7.0	11.0	5.0	3.5
Ker.	38.5	21.7	37.2	36.0	36.0	38.0	40.0	37.0	40.0	41.0
Res.	59.9	78.1	62.7	52.8	51.4	50.3	52.4	51.2	54.6	55.5
Asp.	0.62			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Par.	8.44			7.64	6.03	2.24	1.24	1.52	6.96	12.45
S.		0.22	0.10							
Be°	32.20	32.14	38.60	38.1	39.4	38.4	37.8	38.0	37.7	37.5

Serial	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
Chem.	19	19	19	88	2	88	22	2	72	2
Col.	20	20	20						12&17	
Pub.	35	35	35	75	1	75	40	1		1
Gas.	5.5	4.0	tr	7.48	0.0	7.48		0.1	13.0	0.0
Ker.	46.0	48.0	46.0	40.43	28.6	40.43		31.4	14.2	25.2
Res.	43.7	48.4	53.2	52.09	71.4	52.09		68.5	72.8	74.8
Asp.	0.0	0.0	0.0							
Par.	3.88	2.15	4.91							
S.				0.34	0.19	0.96		0.14		0.20
H_2O					tr			tr	0.4	0.1
Be°	40.4	39.1	38.1	36.0	32.51	34.0	34.5	34.22	30.5	34.13

Serial	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140
Chem.	2	2	79	21	21	21	2	2	2	19
Col.										20
Pub.	1	1		46	46	46	1	1	1	35
Gas.	0.0	0.9	16.4	19.7	17.6	14.3	0.0	1.8	1.1	15.0
Ker.	21.4	31.4	24.5	24.4	26.1	26.3	18.7	46.8	32.1	36.0
Res.	78.6	67.7	59.1	55.9	56.3	59.4	81.3	51.4	66.8	48.5
Asp.										0.0
Par.										2.60
S	0.18	0.24		0.13	0.15	0.15	0.23	0.10	0.24	
H_2O	0.3	0.0					0.1	0.0	0.0	
Be°	31.58	35.3	34.1	33.9	33.6	31.7	30.73	41.91	35.57	37.3

Serial	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150
Chem.	19	19	19	19	72	72	72	72	72	72
Col.	20	20	20	26	53	53	53	53	53	47
Pub.	35	35	35	35	5	5	5	5	5	5
Gas.	9.0	14.0	8.0	4.0	15.8	11.1	11.1	13.0	12.5	4.0
Ker.	40.5	37.0	44.5	38 1	26.3	28.0	21.0		24.7	23.6
Res.	48.5	48.9	47.0	55.8	57.9	60.9	67.9		62.8	72.4
Asp.	0.0	0.05	0.35	0.15						
Par.	4.39	6.37	3.92	4.88						
Be'°	38.2	36.4	37.5	32.9	33.2	26.2	27.2	29.1	28.2	23.9

Serial	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160
Chem.	72	72	72	72	2	2	2	19	19	78
Col.	47	47	47	47				20	20	20
Pub.	5	5	5	5	1	1	1	35	35	35
Gas.	8.2	10.6	8.0	11.9	0.0	0.0	0.0	11.5	7.0	6.0
Ker.	22.6	24.8	21.8	23.4	29.3	24.2	26.7	35.0	39.0	37.0
Res.	69.2	64.6	70.2	64.7	70.7	75.8	73.3	51.9	53.8	54.9
Asp.								1.26	0.12	0.23
Par.									3.04	7.35
S.					0.17	0.25	0.23			
Be'°	23.9	25.3	24.0	28.15	34.52	32.14	32.84	36.7	34.0	35.1

Serial	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
Chem.	19	19	53	53	53	79	79	79	79	88
Col.	20	20								
Pub.	35	35	28	28	28	27	27	27	27	75
Gas.	5.0	11.0	13.5§	23.1§	23.3§	41.6§	39.6§	43.2§	41.7§	20.21
Ker.	36.0	32.5	16.9§	13.0§	15.5§	18.8§	17.9§	17.5§	17.6§	28 96
Res.	58.8	51.8	21.9§	25.3§	23.9§	14.4§	21.8§	23.5§	24.9§	50.83
Asp.	0.50	0.14								
Par.	9.74	6.65								
S.			0.53	0.49	0.46	0.19	0.17	0.24	0.37	0.60
Be'°	35.9	38.1	26.4	30.2	31.9	43.8	44.3	43.4	42.1	33.0

Serial	1171	1172	1173	1174	1175	1176	1177	1178
Chem.	2	72	72	19	19	19	19	2
Col.		63		20	20	20	20	
Pub.	1			35	35	35	35	1
Gas.	0.0	37.5	17.4	13.0	6.0	7.5	1.5	0.0
Ker.	16.8	58.0	34.4	32.0	40.0	39.0	30.0	1.6
Res.	83.2	4.5	48.2	51.9	53.9	53.1	67.3	98.4
Asp.					0.99	0.85	0.90	
Par.				3.01	6.81	2.26	6.28	
S.	0.23							1.20
H_2O								0.60
Be‴	29.67	50.5	36.5	37.3	35.0	33.8	28.3	22.76

§Gas.-200°C (Gas.+naptha.)

ANALYSES EXPRESSED IN PARTS PER MILLION

Serial	1179	1180
Chem.	48	72
Col		80
Pub.	47	
Na	350.	58600.
Ca	21.	12600.
Mg	8.5	2620.
Al		2.4
Cl	378.5	120560.
SO_4	17.2	23.4
CO_3	178.2	0.0
HCO_3		0.0
S		0.0
I		4.0
Mn		1.0
SIO_2 (colloidal)		20.0

NOTE: Water analyses are expressed in milligrams per liter or in the closely approximate parts per million of ions in the water in serials 1179-1255. From 1256-1463 they are expressed in grains per United States gallon unless otherwise specifically stated.

Serial	1181	1182	1183	1184	1185
Chem.	72	12, 33, 49, 80	84	18	18
Col.	10				
Pub.		55	49		
Na	1192.	1500.	2541.	1344.7	1060.7
K	5.8				
Ca.	700.		180.	15.2	45.3
Mg	66.4		65.	9.2	18.6
Cl	18.28	1935.	3929.	1870.	1380.
SO_4	2288.	2000.	40.5	24.2	81.5
CO_3		0.0	438.		
HCO_3		83.0		432.3	585.2
S					7.34

Serial	1186	1187	1188	1189	1190
Chem.	72	38	57	48	61
Col.	63	63			
Pub.			47	47	47
Na			13405.	158.7	38.4
NH_4			28.2		
Ca	20.0	40.0	3735.5	31.5	36.2
Mg	0.0		1050.5	12.8	18.9
NO_3		0.5	97.8		
Cl	517.0	520.0	17686.0	221.0	71.0
SO_4	96.6	454.0	338.0	11.35	
CO_3				91.5	91.0
HCO_3	53.0		24440.8		
S	2.5	2.25			
Total Solids	1384.0	1464.0			

Serial	1191	1192	1193	1194	1195
Chem.	89	47	47	9	9
Pub.	47	47	47	16	16
Na	65.1	12290.	11995.	112910.	108423.
K				170.	209.
Ca	32.1	1609.	1478.	1088.	2515.
Mg.	14.9	487.5	474.6	1488.	926.
Cl	114.0	22922.	22218.	152100.	150400.
SO_4	902.			362.	3768.
CO_3	67.5	254.	228.7		
HCO_3				4535..	61.
Fe		9.7			

Serial	1196	1197	1198	1199	1200
Chem.	9	9	17	17	17
Pub.	16	16	43	43	43
Na	90277.	103927.	94900.	112800.	58900.
K	272.5	247.	200.	1200.	200.
Ca	2345.	2570.	2600.	3000.	2100.
Mg	663.	852.	1500.	2200.	1100.
Cl	123600	143200.	153500.	185000.	95200
SO_4	5043.	4356.	4000.	3800.	3900.
HCO_3	74.	73.			

Serial	1201	1202	1203	1204	1205
Chem.	35	17	17	17	35
Pub.	43	43	43	43	43
Na	112100.	115100.	38200.	14000.	19900.
K	400.	600.	200.	1000.	600.
Ca	7600.	2700.	3600.	1300.	5000.
Mg	1200.	1900.	800.	600.	1600.
Cl	185800.	185200.	67100.	25400.	43400.
SO_4	3800.	3300.	700.	900.	1600.
Br	400.	tr	600.	tr	

Serial	1206	1207	1208	1209	1210
Chem.	35	17	17	75	3
Pub.	43	43	43		
Na	40900	45000.	2500	47700.	58918.
K	600.	900.	200	tr	tr
Ca	3600.	8000.	1100.	7305.	9825.
Mg	1400.	1700.	200.	1656	236.
Cl	71400.	89300	6400	90923.	91000.
SO_4	3400.	800.	100.	132.	495.
CO_3				80.	
Br.	tr	600.		94.	410.
Total Solids					165700.

Serial	1211	1212	1213	1214	1215
Chem.	3	17	17	17	17
Pub.		43	43	43	43
Na	50571.5	46700	47200.	66000.	51400.
K	83.	700.	1100.	500.	900.
Ca.		7900.	900.	9700.	13800.
Mg		1700.	1300.	700.	600.
Cl	78075.	92800.	93200.	120700.	105900.
SO_4		1000.	400.	700.	tr
Br	353.5	400.	500.	400.	500.

Serial	1216	1217	1218	1219	1220
Chem.	17	17	35	17	17
Pub.	43	43	43	43	43
Na	46200.	41600	37300.	38400	43300.
K	800.	300	tr	1090.	1000.
Ca	6100.	7100.	13200.	8200	6900.
Mg	2200.	2400.	1000.	2000.	1700.
Cl	89400.	82500.	82800.	80700.	84700.
SO_4	tr	400	1000	tr	tr
Br	tr	300	tr	400.	400.

Serial	1221	1222	1223	1224	1225
Chem.	35	17	17	35	17
Col.					14
Pub.	43	43	43	43	43
Na	40000.	32100.	34400.	23900.	122900.
K	tr	500.	600.	tr	1000.
Ca	7800.	4500.	4800	2200.	2300.
Mg	1400.	2200.	2400.	200.	1300.
Cl	79400.	63900.	68800.	40000.	195900.
SO_4	tr	100.	500.	1600.	4400.
Br	tr	600.	500.	tr	tr

Serial	1226	1227	1228	1229	1230
Chem.	35	84	84	84	79
Col.	14				
Pub.	43	48	48	48	28
Na	117700.	88.4	93.1	95.8	68380.
K	1000.	tr		tr	
Ca	1000.	36.	73.6	30.2	9588.
Mg	1600.	11.5	17.2	7.2	98.8
Cl	183000.	137.	143.8	117.8	103510.
SO_4	8000.	21.4	tr	tr	780.9
CO_3		68.3	152.		8.4
HCO_3				163.5	
$Fe_2O_3+Al_2O_3$					14.42
Total Solids					183800.

Serial	1231	1232	1233	1234	1235
Chem.	79	79	79	79	15
Pub.	28	28	27	27	27
Na	66123.	23678.	69300.	85026.	78689.
Ca	9081.	7007.	17088.	14000.	14700.
Mg	163.4	831.	665.		2635.
Cl	100680.	51403.	147117.	159750.	155000.
SO_4	90.4				138.
CO_3	6.2	1.0			
Fe_2O_3 / Al_2O_3	1056.0	962.			
Total Solids	177200.	83882.	237078.	265160.	252004.

Serial	1236	1237	1238	1239	1240
Chem.	15	79	15	79	15
Pub.	27	27	27	27	27
Na	88285.	86890.	91400.	74750.	54827.
Ca	14700.	2770.	16550.	3190.	17700.
Mg	3575.	1680.	3455.	1080.	6633.
Cl	151300.	159750.	153300.	159750.	120935
SO_4	274.		263.		93.
Total Solids	246818.	267080.	250931	256320.	192176.

Serial	1241	1242	1243	1244	1245
Chem.	79	79	27	27	27
Pub.	24	24	24	24	24
Na	50200.	50600.	49300.	45300.	50400.
K	200.	300.			
Ca	9571.	6779.	11100.	10100.	14900.
Sr	342.	258.			
Mg	1747.	1896.			
Al	11.	0.5			
Fe	114	1.			
Cl	91000.	89200.	99000.	99000.	104000.
SO_4	407.	378.	400.	400.	400.
SiO_2	13.	12.			
Total Solids	153605.	149434.	159800.	154800.	169700.

Serial	1246	1247	1248	1249	1250
Chem.	79	79	79	79	79
Pub.	24	24	24	24	24
Na	49800.	49320.	51010.	51600.	49120.
K				400.	
Ca	8498.	10220.	9987.	8139.	10415.
Sr.	322.			354.	
Mg	1634.	1828.	1787.	1968.	1737.
Al.				1.	
Fe	2.	192.	244.	441.	250.
Cl	95400.	94800.	97400.	93100.	95200.
SO_4	387.	470.	345.	397.	418.
SiO_2	11.	20.	18.	11.	18.
Total Solids	156124.	156861.	160797.	156460.	157166.

Serial	1251	1252	1253	1254	1255
Chem.	27	79	27	79	79
Pub.	24	24	24	29	29
Na	52910.	46700.	51120.	43400.	37950
Ca	11353.	6224.	11075.	3810.	2660.
Sr.		265.			
Mg	1683.	1436.	1466.	280.	2865.
Al		8.			
Fe		136.			
Cl	104580.	91000.	97490.	74400.	71400.
SO_4	516.	323.	495.	89.6	
SiO_2	18.	6.	17.		
HCO_3				63.5	91.2
Total Solids	171048.	146098.	161669.	115800.	125000.

NOTE: FROM THIS POINT ON WATER ANALYSES ARE EXPRESSED IN GRAINS PER UNITED STATES GALLON UNLESS OTHERWISE SPECIFICALLY STATED.

Serial	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265
Chem.								74		
Pub.	36	36	36	36	36	36	36		36	36
Na								197.2		
K								2.4		
CaO	1.2	0.7	1.5	195.2	210.8	4.7	6.5	19.4	7.1	7.8
MgO	0.2	0.3	0.2	78.5	97.8	0.7	1.4	4.1	2.3	2.2
Fe_2O_3								1.5		
Cl.	0.3	1.2	0.3	7697.3	9065.3	0.8	1.6	8.0	1.3	0.5
SO_3				196.7	164.3	3.7	5.0		1.2	0.7
CO_2	0.4	1.2	1.8			9.1	3.5		7.4	7.8
Br								0.19		
SiO_2								1.0		
Total Solids	13.5	19.9	7.0			25.4	18.2		20.2	23.0

Serial	1266	1267	1268	1269	1270	1271§	1272§	1273§	1274§	1275§
Chem.						1	1	14	14	14
Pub.	36	36	36	36	36	34	34	66	66	66
Na						1700.	269.			
K						6.0	24.2			
Ca						60.8	86.2	65.6	71.0	70.
CaO	3.2	13.4	6.9	6.1	18.6					
Mg						20.2	35.0			
MgO	1.4	6.6	2.6	3.1	9.9					
Fe_2O_3						8.0	8.0			
Cl	0.6	12.9	3.1	2.9	63.9	1986.0	482.	22.	27.	17.
SO_3	0.4	4.4	2.7	2.3	35.3					
SO_4						42.1	32.4	49.2	60.0	32.8
CO_2	3.7	14.9	5.3	5.6	5.4					
CO_3						277.0	121.2			
HCO_3						158.0	83.8			
Br						12.4	1.4			
SiO_2						29.6	24.4			
Total Solids	11.7	66.7	20.3	19.6	173.3					

Serial	1276§	1277	1278	1279	1280	1281	1282	1283	1284	1285
Chem.	14									
Pub.	66	36	36	36	36	36	36	36	36	36
Ca	16.0									
CaO		6.4	3.1	3.7	6.1	5.2	7.2	7.5	198.5	5.5
MgO		2.3	1.98	1.2	3.3	2.4	5.6	2.3	87.3	3.9
Cl	7.5	0.9	0.5	0.9	1.2	1.9	38.7	19.5	7930.0	19.5
SO_3		1.0	0.9	1.2	4.1	9.4	13.3	9.6	192.3	10.3
SO_4	11.2									
CO_2		7.1	4.1	3.2	8.9	3.7	7.3	4.1		2.8
SiO_2	13.0									
Total Solids		19.7	10.9	14.6	26.6	26.4	99.3	65.2		67.7

Serial	1286	1287	1288	1289	1290	1291	1292	1293	1294§	1295
Chem.									12, 33, 49 80	
Pub.	36	36	36	36	36	36	36	36	55	36
CaO	6.9	7.6	6.3	6.9	5.0	4.8	6.7	6.5		9.0
MgO	4.6	4.3	2.8	1.6	1.1	1.98	0.5	1.3		3.0
Cl	14.0	3.97	4.6	1.5	1.2	4.4	1.7	5.7	107.0	11.0
SO_3	11.8	36.5	9.2	5.1	2.5	7.6	4.0	4.1		14.5
CO_2	3.3	15.9	4.2	6.8	3.9	2.9	6.0	3.2		12.0
Total Solids	58.0	97.7	37.7	24.6	13.5	31.0	21.7	27.8		64.3

Serial	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305
Chem.			80	80	80				80	80
Pub.	36	36	49	49	49	36	36	36	49	49
CaO	17.5	7.9				7.0	7.6	6.7		
MgO	5.3	3.2	See Descriptions			3.4	0.8	3.4	See Descriptions	
Cl	4.9	178.5				43.8	28.9	3.9		
SO_3	33.3	24.96	For Analyses			10.1	13.6	3.1	For Analyses	
CO_2	2.0	2.7				7.7	6.4	6.5		
Total Solids	76.0	347.8				103.6	82.7	23.8		

Serial	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	4.8	6.5	6.7	24.0	18.1	3.1	12.4	14.3	16.4	3.5
MgO	1.8	0.4	2.7	9.7	6.7	1.2	5.1	5.6	2.7	0.9
Cl	1.8	7.6	9.6	355.9	245.7	2.5	3.4	205.3	236.3	1.5
SO_3	4.0	3.2	5.3	34.2	13.8	3.5	17.4	21.7	24.4	1.2
CO_2	3.7	3.9	0.9	2.6	3.0	2.7	14.3	3.5	2.3	2.98
Total Solids	20.5	29.8	33.7	664.5	463.1	17.4	61.6	385.6	435.9	14.6

§Expressed in parts per million.

Serial	1316	1317	1318§	1319§	1320§	1321§	1322§	1323§	1324§	1325§
Chem.			14	14	14	14	14	14	14	14
Pub.	36	36	66	66	66	66	66	66	66	66
CaO	16.5	10.2	105.0	132.0	135.0	128.0	112.0	84.0	99.0	106.0
MgO	4.3	3.8	58.0	58.0	50.0	54.0	54.0	47.0	46.0	62.0
Cl	1.4	10.5	221.0	249.0	215.0	219.0	219.0	132.0	182.0	177.0
SO_3	30.2	9.7	108.0	137.0	146.0	139.0	117.0	67.0	79.0	105.0
CO_2	5.5	4.8								
Alkalinity as $CaCO_3$			235.0	260.0	235.0	194.0	170.0	151.0	178.0	199.0
Soluble Salts			880.0	959.0	865.0	828.0		550.0	678.0	721.0
Suspended Solids								1195.0	159.0	66.0
Total Solids	83.4	48.2								

Serial	1326§	1327§	1328§	1329	1330	1331	1332	1333	1334	1335
Chem.	14	14	79							
Pub.	66	66		36	36	36	36	36	36	36
CaO	116.0	123.0		1.9	3.2	8.3	14.23	7.9	3.9	8.2
MgO	60.0	58.0		1.8	2.3	1.2	4.9	2.97	1.6	4.5
Cl	193.0	204.0	624.	0.7	0.8	34.7	216.9	1.1	0.8	4.2
SO_3	106.0	121.0		0.2		7.5	17.7	3.5		8.6
CO_2				3.5	5.3	1.9	3.9	7.4	6.1	9.4
———	203.0	207.0	4.	Alkalinity as $CaCO_3$						
———	745.0	825.0		Soluble Salts						
———	138.0	54.0		Suspended Solids						
Total Solids			1187.	13.9	15.1	74.7	397.3	35.6	23.2	55.1

Serial	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	1.5	3.97	6.5	6.1	4.1	7.5	6.5	22.2	8.9	7.2
MgO	0.9	3.6	3.0	1.6		1.9	1.0	5.1	1.1	3.6
Cl	0.2	1.8	3.2	1.4		8.6	10.4	6.5	232.8	2.1
SO_3	1.1		2.1	0.6	4.1	12.6	8.3	35.7	12.4	7.5
CO_2	1.8	6.9	6.4	5.5	4.4	4.9	5.8	2.1	4.7	5.5
Total Solids	10.0	32.2	34.8	29.1		50.3	42.0	95.3	420.6	35.9

Serial	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	6.3	17.4	6.2	72.7	5.9	4.2	206.2	11.0	6.71	7.1
MgO	2.9	3.8	3.2	17.8	2.6	5.6	92.1	1.4	0.5	3.5
Cl	14.9	286.7	6.3	313.5	2.5	6.8	8610.0	1.4	9.3	3.5
SO_3	9.5	22.3	3.9	139.4	11.3	17.7	163.7	17.9	15.8	14.9
CO_2	3.7	0.6	5.8	27.2	4.9	12.9		11.7	8.5	1.2
Total Solids	53.0	516.2	36.3	799.9	31.6	62.3		58.2	55.1	36.2

Serial	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	14.1	8.9	3.1	10.0	8.0	8.0	1.7	2.7	1.7	3.9
MgO	12.8	8.1	2.5	5.7	5.6	3.7	1.4	1.8	1.5	4.3
Cl	70.8	43.8	1.9	6.1	5.2	3.2	3.4	5.4	3.4	8.8
SO_3	65.8	41.4	3.97	13.8.	3.4	2.9	54.5	9.7	54.5	92.7
CO_2	8.6		7.4	8.5	9.9	7.6	29.6	3.5	29.6	2.96
Total Solids	254.7	173.9	33.4	64.1	49.9	37.4		31.5	114.2	183.2

§Expressed in parts per million.

Serial	1366	1367	1368	1369	1370§	1371§	1372§	1373§	1374§	1375
Chem.					9	9	9	9	9	
Pub.	36	36	36	36						36
CaO	2.7	5.3	4.8	4.0	9.9	190.0	34.0	272.0	36.0	0.3
MgO	3.3	3.1	3.4	2.7	35.4	138.8	60.0	142.0	21.25	1.1
Cl	12.6	2.5	4.7	3.2	15.0	91.0	106.0	450.0	21.0	0.6
SO_4	28.0	96.4	81.1	79.2	28.4	967.0	1104.0	412.0	986.1	3.0
CO_2	2.8									0.9
NO_3					5.11	0.5	0.75	0.64	0.75	
Total Solids	71.0	173.0	149.4	161.7						6.8

Serial	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	6.2	9.0	7.6	6.1	4.2	3.2	5.8	8.0	4.4	5.2
MgO	4.2	1.6	2.5	1.3	1.7	1.7	2.0	0.7	0.9	2.6
Cl	3.7	1.3	0.9	1.6	3.7	21.2	1.1	3.4	8.8	5.9
SO_3	3.6	9.98	5.6	3.7	4.9	8.9	3.3	3.0	3.5	5.6
CO_2	9.3	5.7	6.2	12.1	9.6	2.5	9.8	8.2	11.8	11.3
Total	30.97	30.2	23.9	32.4	32.4	54.5	26.4	27.1	42.7	40.3

Serial	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395
Chem.		12, 33	12, 33				84			
		49, 80	49, 80							
Pub.	36	55	55	36	36	36	48	36	36	36
CaO	6.3			6.7	6.5	6.0		10.0	5.3	10.9
MgO	0.4	See Description		2.6	5.6	3.97	See Descrip-	3.6	3.3	3.7
Cl	1.2			3.2	34.7	25.7	tion for	13.3	3.2	0.4
SO_3	0.1	For Analyses		2.8	4.0	12.4	Analyses	4.2	3.7	14.6
CO_2	4.9			7.3	8.3	6.8		10.2	47.3	6.4
Total Solids	17.96			24.4	88.1	89.5		41.6	27.4	47.3

Serial	1396	1397	1398	1399	1400	1401	1402	1403	1404§	1405
Chem.									43	
Pub.	36	36	36	36	36	36	36	36		36
CaO	3.9	9.0	1.6	10.0	14.1	67.0	9.5	6.1	4556.	6.3
MgO	1.3	5.1	3.8	3.4	2.97	18.4	4.9	5.1	230.	1.2
Cl	2.3	10.2	4.7	39.4	35.2	590.4	4.7	10.5	5638.	8.2
SO_3	0.8	11.16	12.7	16.2	11.7	116.3	5.8	1.98	2527.	2.9
CO_2	4.4	8.98	7.6	8.3	7.7	39.2	15.8	6.3		5.7
Total Solids	26.3	68.6	50.2	114.2	94.6	1200.0	45.3	44.3		34.5

§Expressed in parts per million.

Serial	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	7.6	8.1	5.7	3.3	74.6	tr	4.3	2.4	25.6	4.8
MgO	0.8	3.1	3.3	4.8	16.4			1.8	6.8	1.5
Cl	3.8	3.7	67.7	18.8	104.5	0.6	1.2	1.2	1.8	2.3
SO_3	0.5	3.1	50.5	7.5	160.0	8.4	3.7	3.0	53.8	1.9
CO_2	5.0	6.3		11.6	0.6	5.1	3.3	2.5	6.2	3.1
Total Solids	21.6	23.9	238.8	69.0	458.2	28.3	26.5	17.3	132.8	21.9

§Expressed in parts per million.

Serial	1416§	1417§	1418§	1419§	1420§	1421§	1422§	1423§	1424§	1425§
Chem.				14	14	14	14	14	14	14
Pub.	36	36	36	66	66	66	66	66	66	66
Na				67.0	133.0	86.0	223.0	80.0	45.0	
Ca	79.5	97.	99.5	74.0	142.0	94.0	160.0	144.0	104.0	68.0
$Al_2O_3+Fe_2O_3$				1.0	0.9			0.2	0.4	
Mg	38.	4.	40.	73.2	104.4	34.2	113.4	27.9	51.6	6.0
Cl	43.	7.	180.	45.0	150.0	118.0	183.0	64.0	139.0	15.0
SO_4	165.	24.5	120.2	55.7	283.2	91.1	169.2	106.8	132.0	tr
HCO_3	155.	140.	140.							
SiO_2				23.0	13.0	27.0	23.0	24.0	21.0	
Alkalinity as $CaCO_3$				440.0	524.0	280.0	440.0	392.0	300.0	
Total Solids	700.	375.	770.							

§Expressed in parts per million.

Serial	1426§	1427§	1428§	1429§	1430§	1431§	1432§	1433§	1434§	1435§
Chem.	14	14	14	14	14	14	14	14	14	14
Pub.	66	66	66	66	66	66	66	66	66	66
Na		300.0			248.0	82.0				
Ca	71.0	98.0	106.0	123.0	75.0	55.0	96.0	46.0	73.0	169.0
Mg	tr	tr	19.6	10.8	30.0	14.1		30.0	26.0	55.8
$Fe_2O_3+Al_2O_3$		tr				2.5	20.0			7.0
Cl	40.0	22.0	92.0	31.0	40.0	81.0	12.0	44.0	36.0	370.0
SO_4	20.4	31.8	40.0	18.0	60.0	32.8	12.0		30.0	264.0
SiO_2						6.7				30.0
Alkali	270.0	406.0	340.0	300.0	200.0	293.0		270.0	195.0	320.0

§Expressed in parts per million.

Serial	1436§		1437§		1438§		1439§		1440§	
Chem.	14		14		14		14		14	
Pub.	66		66		66		66		66	
Na			694.0				1585.0		119.0	
Ca	21.0		279.0		117.0		227.0		54.0	
Mg	6.0		76.8		13.2		84.0		7.2	
$Fe_2O_3+Al_2O_3$		tr	199.0		86.0					
Cl	50.0		637.0		45.0				111.0	
SO_4	224.4		444.0		72.0		1336.8		144.0	
SIO_2	10.0		34.0						55.0	
Alkali	285.0		590.0		360.0		300.0		112.0	

Reported In Grains Per United States Gallon.

Serial	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	6.2	4.96	1.6	3.6	20.7	8.6	6.4	9.6	2.7	3.4
MgO	3.0	2.9	1.1	1.3	15.8	2.8		8.5	1.1	0.9
Cl	0.7	1.2	56.6	1.2	9.1	60.9	4.1	31.5	1.5	0.7
SO_4	4.6	3.5	3.8	1.6	63.5	8.2	13.7	6.7	0.5	0.2
CO_2	5.7	5.2	1.2	2.6	9.3	6.0	0.8	6.2	2.9	3.2
Total Solids	21.4	21.6	120.7	29.5	170.4	135.6	28.0	85.5	26.3	11.9

§Expressed in parts per million.

Serial	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460
Pub.	36	36	36	36	36	36	36	36	36	36
CaO	2.2	6.3	4.2	3.3	0.2	4.2	22.4	60.9	14.1	42.9
MgO	0.9	3.4	1.0		0.6	0.7	3.7	8.9	3.9	28.8
Cl	1.2	2.5	0.9	0.7	0.8	0.6	37.2	94.5	15.3	4.5
SO_3		4.6	8.2	2.6	7.5	4.6	18.3	65.6	7.0	118.7
CO_2	2.7	5.4	0.6	1.5	1.1	4.7	11.6	20.4	11.3	40.4
Total Solids	10.3	33.1	15.1	8.5	19.5	17.9	128.2	338.3	73.4	278.6

Serial	1461	1462	1463
Pub.	36	36	36
CaO	43.9	7.3	25.6
MgO	22.1	5.1	3.7
Cl	2.2	7.3	18.9
SO_3	115.2	11.1	28.5
CO_2	31.8	6.3	5.8
Total Solids	250.8	53.1	98.4

Serial	1464	1465
Chem.	72	
Col.	30	
Pub.	70	69
Si	.0015	
Fe	91.60	89.17
Ni	7.23	9.72
CO	0.00	0.67
P	0.235	
Cl	0.22	
Total	99.2865	

§Reported in parts per million.

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